



EDITORIAL
LIBRARY

Your Personal Internet

- ★ Get Recommendations
- ★ Choose the Right ISP
- ★ Protect Your Privacy



The 1997 Top 100 CD-ROMs

MAGAZINE

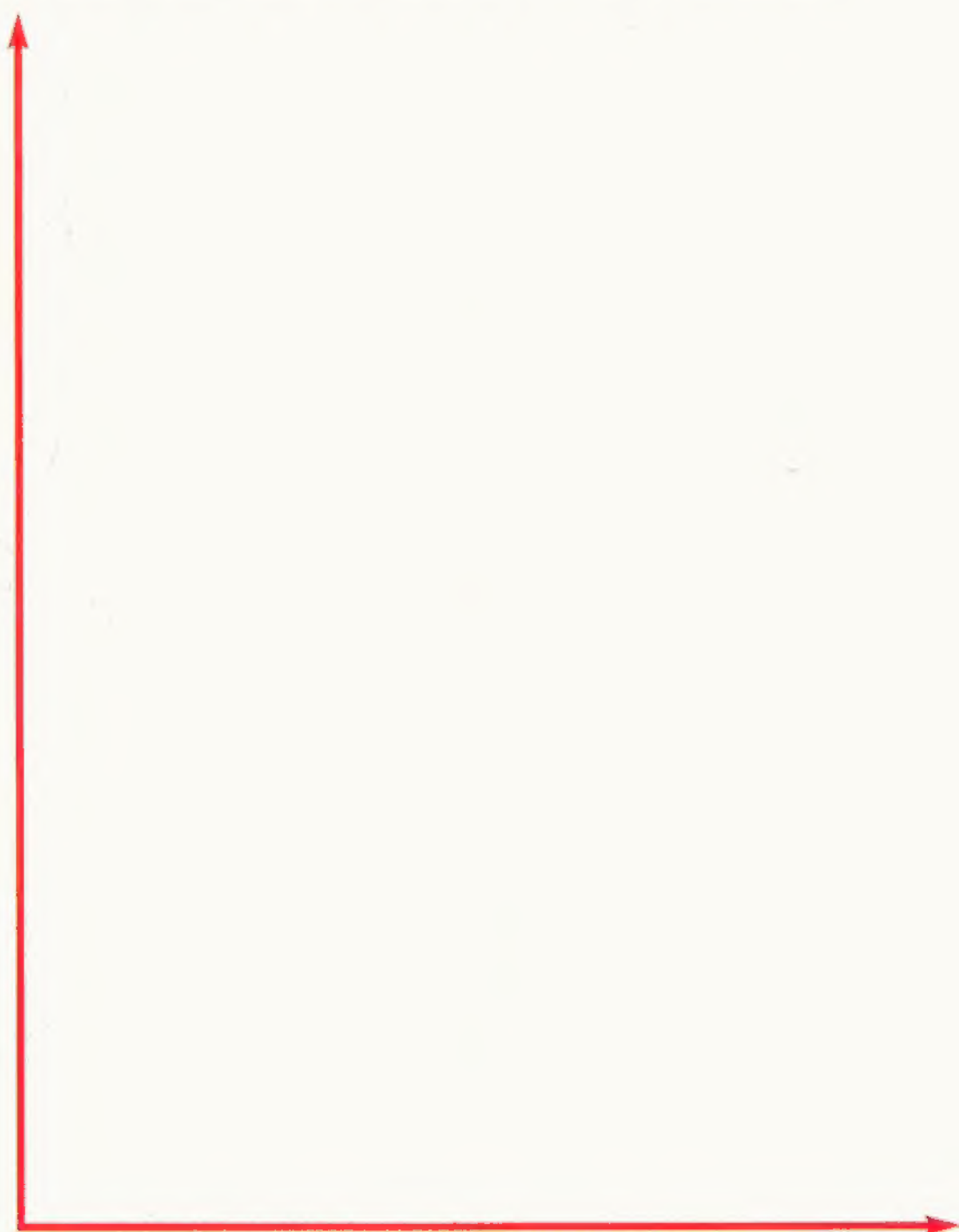
Windows 98

CHANGING THE FACE OF COMPUTING



**Microsoft's
Memphis and IE 4.0
Netscape's Netcaster**

**Christian Murphy was non-verbal.
He lived with a wall between himself and the world.**





CIRCLE 157 ON READER SERVICE CARD

**Microsoft Office 97/
Experts also use it to write
rave**

reviews.

"Microsoft Office is the undisputed king of the office suite hill."
CNET.COM

"An irresistible upgrade to the world's best-selling application suite. It's chock full of Internet smarts, too."
PC/Computing

"...easily the most Web-centric business productivity software ever seen in the lab."
Computer Reseller News

"...a sweeping remake of its flagship suite...designed to make time at the keyboard more productive and, yes, even more enjoyable."
InfoWorld

"The great leap forward...Office 97 is structured as a set of applications wrapped around a logical hub."
Computerworld

"Besides being an incredible productivity tool, the shimmering CD-ROMs create a captivating baby mobile...while the box itself makes a handy recipe holder."
Martha Stewart Living

"Simply put, it's the easiest and most powerful set of office applications we've seen."
Windows Sources

PC Magazine Editor's Choice
PC World "World Class Award"
PC Week Analyst's Choice
Comdex Best of Show
BYTE Editor's Choice
Windows Sources Stellar Award



Where do you want to go today?® www.microsoft.com/office/ **Microsoft®**

The Browser as User Interface



Make no mistake: The new user interface that Microsoft is making in its latest upgrade to Windows and its browser promises to be the biggest change in the way we use computers since graphical user interfaces.

The graphical UI—as evidenced in the Macintosh and in Windows—changed the way everyone uses computers.

The idea is simple. Since we are used to the browser as our interface to the World Wide Web, we'll also make it our computer interface. That way, when you look at your local hard disk, a file server on your LAN, or an intranet or Web site, uniformity prevails. You can add HTML descriptions to your directories. If you want, you can customize a toolbar with a forward and back button as you work with files, making it easier to do repetitive tasks. You also can replace the wallpaper in Windows with a new Active Desktop, which hosts Internet content to which you subscribe.

To some extent, Netscape was first with this idea, suggesting initially that its Netcaster add-on to Navigator would be a good place not only to receive push content and navigate the Web but also to work with your local file system. Netscape has since backed off a bit, but Microsoft has jumped on this concept.

All this becomes even more interesting when you think of the other changes that Microsoft and Netscape have made to their browsers. You can now subscribe to content providers, bringing updates to your desktop. Similarly, Java and ActiveX controls can now reside on your desktop. Thus you can have your screen filled with news tickers and other continually updated data.

For instance, at *PC Magazine*, we're creating specific content that works with both Netcaster and IE 4.0. We're offering distinct features that you can try from our Web page—www.pcmag.com—and make part of your working environment.

So the Internet continues to evolve. But now all these changes can apply to our desktop UI as well. Imagine clicking on a file folder on your local server and having it welcome you, not only in text but also with audio. Perhaps it knows your name and the files in which you're

most likely to be interested. All that is possible with this technology.

I can see the benefit and the drawbacks. The benefit is obvious: one UI for everything. If well done, that's a win for all of us.

On the other hand, many of these pages may overuse the new capabilities, giving us graphics, sound, and perhaps even video where we don't

need them—just as people overused fonts when they first became available on PCs. The technology will require more bandwidth—clogging our existing networks—and additional computing power. The Web integration is still a bit rough around the edges, and any change in the UI requires some retraining.

For Microsoft, the benefit of pushing this through quickly is obvious. Remember, the last time the UI changed, Microsoft was able to gain a lot of ground over competitors that were slow to adopt a graphical UI. This time, it's betting on the same benefit from moving to a browser-based interface.

Until now, anyone with a browser has had to use two UIs: the desktop and the browser. Now you can use the same interface for both. Even after you've installed IE 4.0 or Memphis, you can still launch Netscape's Communicator suite and its Navigator browser. But to do so you'll have to make another decision: Which Web browser? If you're using Microsoft's UI for browsing your local hard disk and your LAN, then switching to an alternative Web browser means more training—a cost and an annoyance even if you prefer the Navigator UI. And of course, Netscape continues to charge for its suite, while IE 4.0 is free and likely to be bundled with every new PC you buy next year.

Tighter integration of the desktop and the Internet is an idea whose time has come. Still, we have to make sure we're implementing it in a way that works for the benefit of users, not just Microsoft.


MICHAEL J. MILLER

POWER HUNGRY? CHOMP ON THIS!

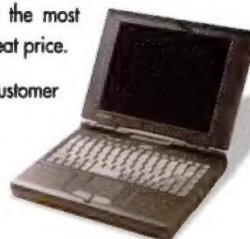
If you've got a hankering for real computing power, call Micron. Now.

Order a Micron computer and you'll get an award-winning system from one of the industries most solid, trusted companies. When you order a PC through our Computers Now!® program, you'll get same day shipment* too. Our pre-configured systems are packed with Intel Pentium Processors, some featuring MMX technology. Get after our Millennia MME and XRU models – power and performance for the most demanding user. Or hit the road with a TransPort Vix notebook for style and flexibility at a great price.



No matter which Micron system you choose, you'll always get our award-winning, 24-hour customer support and an industry-leading warranty you won't find on a shelf anywhere.

Call now for a computer that will have you chomping at the bit – and the other guys eating their hearts out.



MICRON® MILLENNIA MME P200

Intel 200MHz Pentium® processor with MMX® technology
512KB pipeline burst cache, flash BIOS
48MB EDO RAM
4GB Ultra ATA hard drive
24X EIDE variable speed CD-ROM drive
3.5" floppy drive
100MB Iomega Zip drive
32 voice wavetable stereo sound with speakers
U.S. Robotics Sportster 56K x2 internal data/fax modem
PCI 64-bit 3D video, MPEG, 4MB EDO DRAM
17" Micron 700Gx, 26dp (16.0" display)
Tool-free minitower
Microsoft® IntelliMouse™, 104-key keyboard
Microsoft Windows® 95 and MS® Plus! CD
Microsoft Office 97 SBE CDs
Multimedia Xcitement Pak:
(Comprised of MMX technology-based software)
5-year/3-year Micron Power®
limited warranty

\$2,249

With 56K internal data fax/modem \$2,299

MICRON MILLENNIA XRU

Intel 266MHz Pentium Pro II processor (features MMX technology)
512KB internal L2 cache, 2MB BIOS
64MB EDO RAM
4GB EIDE hard drive
24X EIDE variable speed CD-ROM drive
3.5" floppy drive
100MB Iomega zip drive
32 voice wavetable stereo sound with speakers
U.S. Robotics Sportster 56K x2 internal data/fax modem
PCI 64-bit 3D video, MPEG, 4MB EDO DRAM
17" Micron 700Gx, 26dp (16.0" display)
USB Connections
Tool-free minitower
Microsoft IntelliMouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
Multimedia Xcitement Pak (comprised of MMX technology-based software)
5-year/3-year Micron Power limited warranty

\$2,899

TRANSPORT™ Vix P133

133MHz Intel Pentium processor
Intel 430MX chipset
256KB L2 pipeline burst cache
24MB EDO DRAM
2.1GB hard drive
11.3" DSTN SVGA 800x600
IX CD-ROM drive
16-bit stereo sound
Built-in stereo speakers and microphone
Motorola Motorola 33.6 fax/modem with cellular connector
128-bit graphics accelerator
Zoomed video-support
MPEG compatible
2 way infrared port
Touchpad pointing device
Modular floppy drive
Microsoft Windows 95 and MS® Plus! CDs
Microsoft Office 97 SBE CDs
Management Pak
Custom nylon carrying case
5-year/3-year Micron limited warranty

\$2,399

HP PRINTER OPTIONS

HP DeskJet 692c printer - photo-quality color printing for the home, complete with cable \$319
HP LaserJet 6Lxi printer - affordable B&W printing, complete with cable \$429



*Same-day shipment is available for telephone or Internet credit card orders successfully booked by a Micron representative by 2:00pm M-F, Monday through Friday. This service is available to customers who have received approved credit and have their Computers Now! system shipped to the "bill to" address on their credit card.

MICRON POWER® WARRANTY

5-year limited warranty on microprocessor and main memory
3-year limited parts-only system warranty (3-year for Transport Vix)
30-day on-site service agreement for Micron desktop and server systems
30 days of free Micron-supplied software support for Micron desktop systems; 3 national network operating system incident resolutions included for Micron server systems
30-day money back policy
24-hour technical support

The foregoing is subject to and qualified by Micron's standard limited warranties and terms and conditions of sale. Terms and conditions of sale may vary for specific configurations. Copies of this limited warranty may be obtained on our Web site or by calling Micron.

call to order

1.800.776.4509
www.micronpc.com

Micron Sales Hours: Mon-Fri 9am-10pm, Sat 7am-5pm (MT)
Technical Support Available 24 Hours A Day-7 Days A Week
Tollfree from Mexico: 85-800-706-1755
Tollfree from Canada: 800-708-1758 Tollfree from Puerto Rico: 800-708-1756
International Sales: 202-853-8070 • International Fax: 202-853-7393



©1997 Micron Electronics, Inc. All rights reserved. Micron Electronics is not responsible for omissions or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice; prices do not include shipping and handling and any applicable taxes. 30-day money-back policy does not include return freight and original shipping/handling charges, applies only to Micron brand products and begins from date of shipment. All sales are subject to Micron Electronics' current terms and conditions of sale. Lease prices based on 36-month lease. The Intel Inside Logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies.

CIRCLE 203 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

COVER STORY

WINDOWS 98

Memphis & IE 4.0

BY MICHAEL J. MILLER The time we spend on our desktops is becoming integrated with the time we spend on the Web. So take a long last look at the desktop you've been accustomed to using. Starting here, starting now, it changes forever105

Web Integration/Internet Explorer 4.0.....	107
Performance Enhancements.....	115
Manageability and Support.....	116
System Plumbing.....	120
Networking Improvements.....	121
Memphis Beta 1 Highlights.....	108
IE 4.0: More than Memphis.....	112
What to Expect from Memphis Beta 2.....	115
Should You Upgrade to Memphis Now?.....	120

WEBCASTING VS. NETCASTING

The Browser Push Is On

BY SCOT FINNIE Push technology is the latest front in the battle between Microsoft and Netscape. Both are vying to control the standards for delivering content to your desktop.....123

Microsoft's Webcasting and Active Desktop.....	124
Netscape Netcaster.....	125
Tuning In to Internet Explorer.....	124
Tuning In to Netcaster.....	125
The Politics of Push.....	128
Publishing with CDF and Netcaster.....	128

RECOMMENDATION SYSTEMS

Advice from the Web

BY RICHARD V. DRAGAN Tell a Web site what you like and don't like; it hears from other users what they like, then it tells you some other things you'll probably like, too. What's not to like?.....133

Firefly Passport Office.....	135
GroupLens Recommendation Engine.....	136
LikeMinds Preference Server.....	141
WiseVire.com.....	142
The Basics.....	134
Summary of Features.....	134
Making It Personal.....	144



SPECIAL PULLOUT SECTION



Choosing Your ISP

BY LEON ERLANGER Your route to the Web is your main line to all the action. Are you happy with yours? Even if you are, check out our special section to see how your ISP does against the biggest U.S. providers. We surveyed users and enlisted the help of a top ISP tracker.....205



WWW.PCMAG.COM

New Top 100 Web Sites

It's not easy to get on PC Magazine's list of Top 100 Web sites, and once you get on it, remaining there is even harder. For the third time this year, we've refreshed our list with the latest and greatest new sites. Find out which sites have what it takes, and visit our updated Hall of Fame, where we honor our four- and five-time winners.

UP FRONT

From the Editor-in-Chief.....	4
Pipeline.....	9
Letters.....	21
Trends.....	28
► Compaq fires up a made-to-order distribution strategy	
► Corporate America invests in Java development	
► Inside PC Labs	
► Where does Microsoft want to go today?	

First Looks.....	45
► In through the thin door:	
Five LCD monitors from CTX Opto, Hewlett-Packard, NEC, Sceptre, and ViewSonic	
► Primavera SureTrak 2.0	
► Delphi 3	
► HP LaserJet 6L	
► Psion Series 5	



Second Looks.....81

- Tektronix Phaser 450: Speedier prints
- Get the Word out

COLUMNISTS

JAKE KIRCHNER.....	30
BILL MACHRONE.....	85
JOHN G. DVORAK.....	87
INSIDE TRACK.....	89
JIM SEYMOUR.....	93
BILL HOWARD.....	95

Internet

BY GAIL SHAFFER

The Internet—specifically, the World Wide Web—couldn't help but change as it insinuated itself into the lives of so many over the past few years. Now that the public at large has had a chance to interact with it, the Web is necessarily growing in directions that the public wants. In this issue, we look at the ways the Web is becoming more personalized100

AFTER HOURS

Top 100 CD-ROMs

BY MICHAEL E. RYAN

For our fourth annual roundup, more than 25 reviewers evaluated nearly 400 CD-ROMs to arrive at these top 100, which garnered the highest ratings for setup, content, and presentation to the user. Many hook into the Internet.....365

Educational Fun.....	366
Games.....	372
Home and Hobby.....	381
Reference.....	390



INTERNET SECURITY

Protection at the Desktop

BY SCOT FINNIE The Internet brings terrific opportunity but more than a little risk149

Personal Security Suites	
Desktop Security Suite.....	152
eSafe Protect.....	152
SurfInShield Xtra.....	158
Cookie Managers	
Complete Cleanup.....	159
Cookie Crusher 1.01.....	162
Cookie Master 2.0.....	162
Cookie Pal 1.0.....	166
Crumble 97.....	166
IEClean32 and NSClean32.....	168
PGPcookie.cutter for Windows NT.....	168
S/MIME E-Mail	
e-Mail 1.0.....	172
E-Mail Connection 3.1a.....	172
ExpressMail 2.0.....	178
MailSecure 1.0.....	178
Netscape Messenger.....	180
WorldSecure Client.....	180

CHAT SOFTWARE

Talk of the Internet

BY HEATH H. HEREL No matter what the topic, chat is a natural way for Netizens to converse.....181

Chat Server 1.59d.....	182
E-Pub Chat 1.01.....	183
eShare Expressions 1.1.....	186
The Palace 1.1.....	188
Rooms 3.0.....	191
Virtual Places 2.1.....	192
VolanoChat 1.1.....	195

INTERNET SERVICE PROVIDERS

More Speed in the Pipeline

BY TONY POMPILI You still can choose between an online service and an ISP to get to the Web....197

Online Services.....	200
Internet Service Providers.....	224

PC TECH

Energizing Your Web Pages.....247

A new level of sophistication.

Tutor.....257

How OSs see users.

Operating Systems.....263

Virtual private networking.

Power Programming.....269

MFC extension DLLs.

Utilities.....275

Automate shutdown tasks.

PC SOLUTIONS

User-to-User.....287

Instant backups; selecting your sounds.

Ask Our Advisors.....298

- Hardware
- Operating Environments
- Word Processing
- Spreadsheets
- Databases

AFTER WORDS

Abort, Retry, Fail?.....400

NETWORK EDITION

Follows page 96

Industrial-Strength Connections.....NE1

- Ascend Max 4048.....NE6
- Bay Networks 5399 Remote Access Concentrator.....NE8
- 3Com AccessBuilder 5000.....NE8

ALSO IN THIS ISSUE

PC Magazine Marketplace.....	331
Premier.....	331
Classified.....	348
BusinessCard.....	362

► 3Com Total Control Enterprise Network Hub.....NE12

First Looks

- Telephony hardware:
- Jetstream Front Desk...NE17
- Network backup software:
- Replica for Windows NT Single Server Edition...NE18

Reader Service Card.....	387
Advertisers' Index: Companies.....	395
Advertisers' Index: Products.....	396
Coming Up.....	398
Editorial Product Index.....	399

Pipeline

The Sound of PC Music



No one really believes that the PC can ever truly reproduce the sound of music, let alone behave like a musical instrument. No one except engineers at Stanford University and Yamaha, that is.

Music that offers realism, expression, and interactivity could be on its way to the Web, now that Stanford and Yamaha are combining their intellectual-property portfolios in computer tone generation and sound synthesis. Licenses to over 400 patents will be available to independent developers as part of the so-called Sondius-XG program.

Sondius is a package of technologies based on "digital waveguide synthesis" that the Stanford Center for Computer Research in Music and Acoustics developed. The technique is a form of "physical modeling," which recreates the expressive, natural sound of live musical instruments.

The computationally intensive process creates mathematical models that simulate each instrument's acoustic characteristics. Traditional approaches model the sound only, but physical modeling identifies an instrument's physical parameters and then determines what the sounds will be.

Combined with Yamaha's XG Format—a set of tone-generation rules that are extensions to General MIDI—

Sondius-XG allows players to create new sounds and imaginary instruments, from a 10-foot clarinet to a plucked flute. It's also scalable—allowing, say, a baby elephant's trumpeting to "grow" into an adult's.

The first licensee is Mountain View, California-based Staccato Systems, a Stanford spin-off that's developing software for creating virtual instruments, such as a trumpet played with a violin bow.



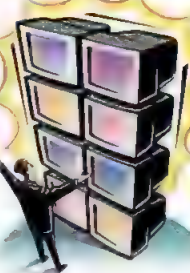
Video Walls

In testing Microsoft Windows 98 for this issue's cover story, PC Labs found a favorite new feature: support for turning several monitors into one giant display. The beta version that PC Labs tested supports four monitors at once; Microsoft promises that the next beta will support eight, enough to create a video wall.

To create a virtual layout, PC

Labs lashed together four PCI graphics adapters in a system and then connected a monitor to each. After some tweaking (you can read about it in the cover story), we were able to set the displays to different resolutions and color depths.

Of course, even if multiple-monitor support seems like an innovation to PC users, it's not that new. The Macintosh has had it since the 1980s.

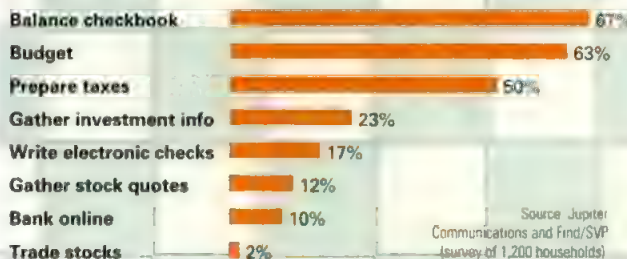


"Cutting-edge technology and criminal prosecutions cannot substitute for responsible mothers and fathers."

—President Bill Clinton, on paving the way to a family-friendly Internet.

Kitchen-Table Finances

Consumers perceive the PC as a tool to get control of their finances. Based on a survey of PC households, 19.1 million of them use PCs for financial chores, and financial apps rank third in popularity, behind games and kids' software



Good Medicine

With an estimated 10,000 medical- and health-related Web sites, it's no wonder that the topic of health accounts for an estimated one-third of all Internet searches. The National Library of Medicine (www.nlm.nih.gov) recently opened to the public MEDLINE, the world's most extensive and reliable collection of published medical information, for free.

"Medical breakthroughs are happening so rapidly that I believe health care professionals and consumers alike should be able to tap into the most recent medical information."



said famed heart surgeon Michael E. DeBakey, M.D.—chair of NLM's Board of Regents—at the launch event on Capitol Hill.

www.pcmag.com

Internet Service Providers

Happy with your ISP? Find out if your feelings match our survey respondents' and join our discussion on fast Web access.

Brand-New: Top 100 Web Sites

Getting on our Top 100 list isn't easy, and staying on it is even harder. Find out which sites made it.

The Windows 98 Saga Begins

Check in for the latest Windows 98 news as Microsoft races to make a 1997 deadline.

Recommendation Systems Arrive

Find out more about how collaborative filtering works and how you can best use it for Web surfing.

And Don't Miss These Web Extras

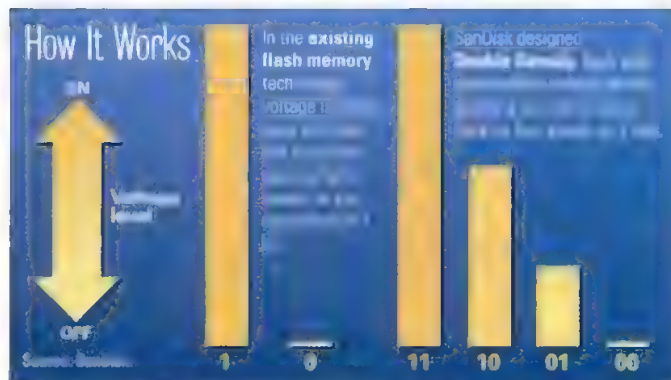
Daily industry analysis, up-to-the-minute reviews, and weekly commentary from John C. Dvorak, Michael J. Miller, and Don Willmott.

Pipeline

Flash Memory on the Double

Manufacturers of handheld computers and cameras are increasingly turning to tiny flash memory cards as an ultraconvenient way to store everything digital, from photos to audio. And the market for miniature memory is getting even bigger as more handheld computers, digital cameras, pagers, phones, and audio recorders arrive.

These trends spell good news for flash memory makers. Until now, SanDisk Corp.'s CompactFlash memory cards have maxed out at 85MB. But with Double Density technology, SanDisk can pump up capacity to 150MB and drive down costs by 25 percent.



The concept—involving adjustments to voltage levels—has been floating around for years; SanDisk engineers figured out how to make it work. The real challenge was discerning the intermediate states—those between on and off—which are measured in millivolts. Although that's easy to do for one cell, it's not easy for millions of cells, explains Ed Cuellar, a SanDisk product manager. The key was understanding the circuitry required to read and write to flash memory, he says.

SanDisk expects the technique to cut prices significantly. In high volumes, 85MB Double Density cards go to manufacturers for \$650 each; a card based on the existing "binary" techniques costs \$865.

No More Smears

Canon has come up with an innovation that makes plain paper repel water. Its Plain Paper Optimized Printing (P-POP), a system available on its new Canon BJC-7000 Bubble Jet color printer, primes the paper with a quick-drying liquid solvent that keeps the ink in place without penetrating the paper.

An instant before the print-head releases a drop of ink, a drop of Ink Optimizer pre-coats the paper. The process sets the dyes



so that any liquid is repelled. Without the treatment, plain paper would absorb liquid and spread the ink. The result: You can riddle a color document with squirt-gun fire and the ink won't smear and smudge.

THIS ISSUE'S CONTRIBUTORS: Carol Levin, Cade Metz, Sebastian Rupley, Larry Seltzer, and Don Willmott.



Ringing Up Web Profits

Cash registers are finally ringing on the Web. Revenue growth and profitability among commercial Web sites are booming, with profits projected to reach \$24.4 billion this year and \$1 trillion by 2001, according to a survey of over 3,500 commercial Web sites that market research firm Activmedia recently conducted. The vast majority of Web revenue—85 percent—comes from product and service sales, with the balance coming from advertising. Other findings:

- Three in ten commercial sites report profitable operation—unchanged from a year ago, although the number of Web sites has increased sevenfold;
- three in five commercial Web sites generate sales revenue, up from one in three a year ago;
- one in six commercial Web sites attracts advertising revenue, up threefold from a year ago;
- one in ten Web sites is a "high-volume" producer, with \$10,000 or more in monthly income. These sites account for 90 percent of all Web revenue.

The ABCs of Web Design

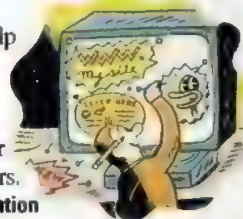
Do you know what you're doing when you design a Web site? Dr. Jakob Nielsen, Distinguished Engineer at Sun Microsystems, has been studying the good, the bad, and the ugly of Web site design for the past four years, and by now he knows all the pitfalls. He offers this commonsense advice:

• **Don't design for a splashy demo.** Design for the user experience, and remember that most visitors will come to your site with a slow modem and a less-than-perfect display.

• **Don't base your site design on the company org chart.** It's natural to want to divide up the work that way, but it doesn't help visitors to your site who are looking for fast answers.

• **Use animation sparingly, and only to illustrate a point, not to distract the user.** Most users say they dislike animations. Some assume an animation is an advertisement.

• **Face the fact that a site must be kept fresh at all costs.** A Web site is as costly to maintain as it is to build. If you spend \$10,000 to get your site going, be prepared to spend \$10,000 a year for maintenance. Budgeting 100 percent of the initial cost for upkeep is a good rule of thumb.



Top-Selling Retail CD-ROMs

- 1 **X-Wing vs. Tie Fighter** LucasArts
- 2 **Microsoft Windows 95 Upgrade** Microsoft
- 3 **PrintMaster Gold Deluxe Publisher Suite** Mindscape
- 4 **Viruscan** McAfee
- 5 **First Aid Deluxe** CyberMedia
- 6 **Diablo** CUC Software
- 7 **Myst** Broderbund
- 8 **Command & Conquer Red Alert** Virgin
- 9 **Need for Speed II** Electronic Arts
- 10 **Microsoft Flight Simulator** Microsoft

Source: PC Data. Data for May.

Oracle8

**Unprecedented economies of scale.
10 times more users. 10 times more data.**

What the experts are saying:

"It's hard to overstate the significance of Oracle8. Object-relational technology is no longer just for pioneers and early adopters. We recommend that Oracle8 be implemented as soon as possible."

—Patricia Seybold Group

"The installation and upgrade tools for Oracle8 rival a Macintosh for ease-of-use."

—Standish Group

"Oracle8 contains significant enhancements that improve performance, scalability, reliability, availability, and efficiency both for OLTP and DSS applications, including impressive scalability and ease-of-use enhancements for NT."

—International Data Corporation

"Oracle has the momentum of a battleship and the maneuverability of a jet ski. Oracle8 will be impossible to stop."

—Aberdeen Group

The Gartner Group's report had really nice things to say too, but we don't have permission to quote from it. So order that or any other analyst's report on Oracle8.™ Then, call us at 1-800-633-0518, ext. 11678 or check out <http://www.oracle.com/st/>

ORACLE[®]
Enabling the Information Age™



AT 360 DPI
YOU SEE A LADY IN HER
BATHING SUIT.

AT 720 DPI
YOU SEE HER BATHING
SUIT IS WET.

YOU'VE GOT TO SEE IT IN

EPSON

COLOR.



AT 1440 DPI
YOU SEE HER BATHING
SUIT IS PAINTED ON



An amazing paint job makes you think it's a bathing suit. These astonishing new printers let you know it's not. 1440 x 720 dpi. Photo Quality color. Laser-sharp black text. All from our exclusive Micro Piezo™ Technology—for a smaller, more consistent dot. You'll get print quality that's already won 33 major awards, including PC Computing's 5 Star Rating. In standard format or wide format. PC/Mac compatibility. Optional internal Ethernet. Up to 8 ppm black/7 ppm color on the Epson Stylus® Color 800. Plus a 2-year warranty. Call 1-800-GO-EPSON (ask for operator 3064) or visit us at www.epson.com for more details. For every detail, look at the output.

INTRODUCING THE WORLD'S FIRST 1440 DPI COLOR INK JET PRINTERS.



EPSON Stylus Color 800 about \$449. High-performance business printer.

EPSON Stylus Color 1520 about \$799. The versatile wide format printer.

VIDEO ON THE WEB. NOT THERE YET?

With Broadway,™ it's easy
to add exciting, attention-
grabbing video clips to your
Web site. Just capture video
from any source. Edit in a
snap. Compress your edited
clips into MPEG, the interna-

WRONG!

tional standard. Then click ...
and you have video on your
Web site! Sound easy? It is.
Broadway is geared to any
level PC user. It costs less
than \$1000, and it's winning
rave reviews from critics.
Please visit our Web site
or call to find out more.



www.b-way.com/web
800-249-1090 ext. 35

BROADWAY

Video Made Easy.

CIRCLE 018 ON READER SERVICE CARD
OR GO TO WWW.PCMAG.COM/ProductLink



EDITOR-IN-CHIEF Michael J. Miller

EDITOR Jake Kirchner

EXECUTIVE EDITORS Bill Howard, Peter McKie, Gail Shaffer, Don Willmott

EXECUTIVE DIRECTOR, PC LABS C. James Galley III

ART DIRECTOR Laura Baer

SENIOR NETWORKING EDITOR Frank J. Derfler, Jr.

SENIOR ONLINE EDITOR John Clyman **SENIOR EDITORS** Leon Erlanger (Networking and Communications), Carol Venezia (First Looks), Sebastian Rupley (West Coast)

MANAGING EDITOR Paul B. Ross

RESEARCH EDITOR Jim Bartimo

SENIOR ASSOCIATE EDITORS Carol Levin (Trends), Sharon Terdeman (Technical Columns) **ASSOCIATE EDITORS** Jamie M. Bsates (Hardware), Toni F. Kistner and Sarah L. Roberts (Networking and Communications), David Lidsky (Internet), John Morris (Software), Michael E. Ryan (After Hours) **ASSISTANT MANAGING EDITOR** Kim Schueler **PRODUCTION EDITOR** Monica Signano **COPY CHIEF** Glen Bousseau **STAFF EDITORS** Mary E. Behr, Robert Daly, Yvonne Koulouthros, Regina Kwon, David R. Lambert, Elynn J. McCasland, Michael W. Muchmore, Melissa J. Perenson, Tom Ponzo, Anush Yeghazarian **SENIOR WRITER** Robert S. Anthony **STAFF WRITERS** Karen J. Bannan, Angela Hickman, Cade Metz **SENIOR COPY EDITORS** Jennifer Golub, Joseph N. Levine **COPY EDITORS** Paul Dwyer, Michael Feist, Bill Kravitz, Barbara McGeech, Josh Miller, Ann Ovodow **PRODUCTION MANAGER** Patricia Perkowski **SENIOR LAYOUT EDITOR** Lilian Gaffney **LAYOUT EDITOR** Michal Dluginski **PRODUCTION SYSTEM SUPPORT ANALYST** Nancy Goodman-Slayback **LIBRARIAN** Nancy Sirapyan **LIBRARY ASSISTANT** Dolores Williams **EDITORIAL RESEARCHERS** Jennifer L. Anderson, Gary Berline, Nancy E. Hirsch, Josh Levy, Michael N. Rusignuolo **EDITORIAL ASSISTANTS** Brett Krasnowe, Leslie Sorich **SYSTEM SUPPORT MANAGER** Craig Elison **NETWORK SUPPORT ANALYST** Melvin Acavado **COMMUNICATIONS MANAGER** Patricia Reger **ASSISTANT TO THE EDITOR-IN-CHIEF** Christine Curti **ASSISTANT TO THE EDITOR** Rita Abrahamian **ASSISTANT TO THE EXECUTIVE EDITORS** Christina M. Evelyn **ADMINISTRATIVE ASSISTANT** Christina Okang **SYSP, PC MAGNET** Ken Hipple **EDITORIAL INTERN** LaToya Souvenir

CONTRIBUTING TECHNICAL EDITOR Neil J. Rubenking **CONTRIBUTING EDITORS** Bill Machrone (Editorial Director, New Products), Douglas Boling, Padraic Boyle, Bruce Brown, Brian Butler, Sheryl Canter, John C. Dvorak, Les Freed, Daniel Grotte, Sally Wiener Grotte, Michael J. Mefford, Edward Mendelson, Jan Ozer, Charles Petzold, Stephen W. Plain, Tony Pomplil, Alfred Poir, Jeff Prossie, John R. Quain, Sal Ricciardi, Steve Rigney, Winn L. Rosch, Joe Salemi, Jim Seymour, Barry Simon, Luisa Simone, Craig Stinson, M. David Stone

SENIOR ASSOCIATE ART DIRECTOR Richard Demler **ASSOCIATE ART DIRECTORS** Charles Conover, Dean Markadakis, Michael Scowden **ASSISTANT ART DIRECTOR** Lora Morgenstern **GRAPHICS DIRECTOR** David Foster **GRAPHIC ARTIST** Mark Tyner **ART PRODUCTION MANAGER** Talar Min **CONTRIBUTING PHOTOGRAPHER** Thom O'Connor **ASSISTANT TO THE ART DIRECTOR** Frieda T. Smallwood

DIRECTOR, PC LABS, WEST COAST Steve Buehler **TECHNICAL DIRECTORS** Ben Z. Gottasman (Software), Nick Stam (Hardware), Larry Seitzer (Internet, PC Tech) **DIRECTOR, OPERATIONS** John R. Delaney **PROJECT LEADERS** Laura Cox (First Looks), Diane Jecker (Software), Jeff Mace (Graphics/Hardware), Jay Munro (Internet, PC Tech), Robert Norton (Network Edition), Jeffrey G. Witt (Networking and Communications), S. Jee Yang (PCs) **PROGRAMMERS** Richard V. Dragan, Win Swarr **PRODUCT TESTING MANAGER** Charles Rodriguez **TECHNICAL ANALYSTS** Andrew Go, Russell Iwanchuk, Amy Leung, Margaret A. Piemonte, Rick Rovegno, Mark Valentine **SUPPORT TECHNICIANS** Oliver Kaven, Melanio Lopez, Jacqueline Paredes, Kevin Young **INVENTORY CONTROL MANAGER** Tom Kennedy **INVENTORY CONTROL COORDINATORS** Rob Graydon, Bryan Hughes, William Pagan **ADMINISTRATIVE ASSISTANT** Courtney L. Trabon

PC MAGAZINE CD

MULTIMEDIA PRODUCER Stephen Baldwin

PC MAGAZINE ONLINE

MANAGING EDITOR Tim Albano **WEB DESIGNER** Albert Larew **SENIOR EDITOR** Heather Crombie **SENIOR PROGRAMMER** William Ulrich **SENIOR TECHNICAL EDITOR** Thomas W. Giebel **TECHNICAL EDITOR** Webster T. Mudge **STAFF EDITORS** Troy Dreier, Richard Egan, Tracy Karievsky **PUBLISHER** Nancy Newman

NATIONAL ASSOCIATE PUBLISHER Peter Longo **NATIONAL SALES DIRECTOR** Vickie Pinsky **BUSINESS DIRECTOR** Andrew J. Cole **ASSOCIATE BUSINESS MANAGER** Christine Holsten **GROUP MARKETING DIRECTOR** Kathleen Goodwin **ASSOCIATE MARKETING DIRECTOR** John Wisdom **ASSOCIATE RESEARCH DIRECTOR** Gordon Plutsky **EVENTS MANAGER** Dawn Gudelis **MANAGER, PROMOTION AND PUBLIC RELATIONS** Lynne Hasluck

SENIOR ADVERTISING PRODUCTION MANAGER Susan Conrad **ADVERTISING PRODUCTION MANAGER** Robert Joy **ASSISTANT ADVERTISING PRODUCTION MANAGERS** Mark Cannady, Ivis Fundicely **EDITORIAL PRODUCTION MANAGER** Pamela J. Berkowitz **COORDINATOR, EDITORIAL PRODUCTION** Louise Laberge

ADVERTISING OFFICE: One Park Ave., New York, NY 10016-5802; 800 33 MAG AD, 212-503-5100

THE INDEPENDENT GUIDE

PC Magazine is the Independent Guide to Personal Computing. Our mission is to test and review products and report fairly and objectively on the results. Our editors do not invest in firms whose products we review, nor do we accept travel tickets or other gifts of value from such firms. Except where noted, *PC Magazine* reviews are of currently available products. We review products without regard to advertising or business relationships with any vendor. Softbank, the corporate parent of Ziff-Davis Inc., has made a number of strategic investments in high-technology companies. A list of those companies is available online at www.pcmag.com/faq, and we will alert our readers to such investments whenever pertinent.

HOW TO CONTACT THE EDITORS

We welcome comments from readers. Send them to Internet address pcmaga@zcd.com or to *PC Magazine*, One Park Ave., New York, NY 10016-5802. Please include a daytime telephone number. *PC Magazine's* general number is 212-503-5255. The West Coast Operations number is 415-513-8000. We cannot look up stories from past issues, recommend products, or diagnose problems with your PC by phone. For an index of past issues and a list of upcoming stories, browse www.pcmag.com.

If you are dissatisfied with a product advertised in *PC Magazine* and cannot resolve the problem with the vendor, write (do not call) Angela Tuka, Advertising Department, at the above address. Please include copies of your correspondence with the vendor.

SUBSCRIPTION SERVICES

The subscription rate is \$49.97 for a one-year subscription (22 issues). Additional postage for orders outside the U.S.: Please add \$36 per year (American currency) for surface mail. For subscription service questions and address changes, call 303-665-8930 in the U.S. or 303-604-7445 elsewhere. You can send faxes to 303-604-7455, or 303-604-0540 outside the U.S. Or write to *PC Magazine*, P.O. Box 54093, Boulder, CO 80322-4093. We periodically make lists of our customers available to mailers of goods and services. If you do not wish to receive such mailings, please write to us and include a copy of your mailing label. For back issues (subject to availability), \$9 per issue (\$9 outside the U.S.), send check or money order to Back Issues Dept., Ziff-Davis Inc., P.O. Box 53131, Boulder, CO 80322-3131. Additional information on advertised products can be requested online at www.pcmag.com/ProductLink.

PC MAGAZINE CD

PC Magazine CD, the interactive CD-ROM companion to *PC Magazine*, is available quarterly. To order (\$49.95 per year in the U.S., \$72 in Canada, \$99 elsewhere), please call 800-335-1195, or 303-665-8930 outside the U.S. and Canada. Or write to *PC Magazine* CD, P.O. Box 54944, Boulder, CO 80322-9494.



PC MAGAZINE ONLINE

PC Magazine is on the World Wide Web (www.pcmag.com) and The Microsoft Network (Go To pcmagazine). We operate *PC MagNet*, an on-line service of ZDNet, hosted by CompuServe. (For details, see the Utilities column.) *PC Magazine* subscribers receive free access to our online archives.



PERMISSIONS, REPRINTS

Material in this publication may not be reproduced in any form without permission. If you want to quote from an article or use *PC Magazine's* logo in conjunction with an Editors' Choice designation, write Chantal Tucker or fax her at 212-503-5475; for information on reprints, please contact Ziff-Davis Reprints at 800-825-4237.

The following are registered trademarks of Ziff-Davis Inc.: DOSMark, NetBench, PC, PC DIRECT, PC Labs, PC MAGAZINE, PC MAGAZINE AWARD FOR TECHNICAL EXCELLENCE, PC MAGAZINE EDITORS' CHOICE, PC MagNet, ServerBench, WinBench, Winstone, and ZD.

The following are trademarks of Ziff-Davis Inc.: Abort, Retry, Fail?, After Hours, BusinessCard, Corporate Developer, CPUmark, Extending Your Apps, Features Plus, First Looks, First Looks Plus, Lab Notes, New & Improved, OFF THE STACK, PC Bench, PC Magazine At Home, PC Magazine CD, PC Magazine Marketplace, PC Solutions, PC Tech, Pipeline, Power Programming, Quick Clips, Road Only, ScreenDemos, Tech Notes, Tutor, User-to-User, WinDrain, ZDigit, ZDNet, and ZiffNet.

Other trademarks and trade names used throughout the publication are the property of their respective owners.

Copyright (c) 1997 Ziff-Davis Inc. All rights reserved. Reproduction in whole or in part without permission is prohibited.

An Engineer's Proverb:

*Old printers
never die.*

Sometimes you just wish they would.

Introducing Cash In & Trade Up. The perfect excuse to get rid of those slow, old printers you've got sitting around the office. Until October 31, you can send in practically any old printer (it doesn't even have to be one of ours) for cash or credit towards a new HP LaserJet or DeskJet 1600C printer. You can even trade in your old print server for credit towards a new HP JetDirect print server. With an offer like this, there's no reason you can't have fast, efficient printers—and finally get rid of those old things you're using now. To find out more, call your local reseller or 1-800-TRADE ME, or log on at www.hp.com/info/tradeup. **Built by engineers. Used by normal people.**



MICRON TRANSPORT Xae

166MHz Mobile Intel® Pentium® processor with MMX™ technology
48MB EDO RAM
3GB removable hard drive
13.3" TFT XGA display

STANDARD FEATURES

Intel 430TX Mobile PCI chip set
512KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator, 2MB DRAM
20X modular CD-ROM drive with AutoPlay™
Pick-a-Point™ dual pointing devices
16-bit stereo sound (supports surround and wavetable sound)
Built-in stereo speakers and microphone
Integrated 33.6 Kbps technology modem* with full duplex telephony and cellular capability
CardBus- and zoomed video-ready
2 infrared ports, 1 front, 1 rear
S-video and NTSC-video capability
USB connector, built-in game port
Management Pak, Executive Travel Pak
2 modular expansion bays (hard drive, CD-ROM drive, 3.5" floppy drive, lithium-ion battery)
Custom nylon carrying case
Microsoft® Windows® 95 and MS® Plus! CD
Microsoft Office 97 SBE CDs
5-year/3-year Micron Power™ limited warranty

\$5,399

Bus. lease \$170/mo.

MICRON TRANSPORT Xpe

150MHz Mobile Intel Pentium processor with MMX technology
32MB EDO RAM (80MB max.)
1.4GB removable hard drive
12.1" active matrix color display, 800x600

STANDARD FEATURES

Intel 430MX Mobile PCI chip set
256KB L2 pipeline burst cache
PCI graphics accelerator, 2MB VRAM
8X modular CD-ROM drive
Pick-a-Point dual pointing devices
Sound Blaster 16-bit stereo sound
Built-in stereo speakers and microphone
Motorola Montana 33.6 fax/modem
CardBus- and zoomed video-ready
2 infrared ports, 1 front, 1 rear
S-video and NTSC-video capability, built-in game port
Management Pak, Executive Travel Pak
2 modular expansion bays (hard drive, CD-ROM drive, 3.5" floppy drive, lithium-ion battery)
Custom nylon carrying case
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
5-year/3-year Micron Power limited warranty

\$3,499

Bus. lease \$119/mo.

MICRON TRANSPORT Tli

133MHz Intel Pentium processor
16MB EDO RAM (40MB max.)
1.4GB hard drive
11.3" SVGA DSTN 800x600

STANDARD FEATURES

256KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator
MPEG compatible
Zoomed video-ready
Touchpad pointing device
16-bit stereo sound
Built-in stereo speakers and microphone
2-way infrared port
NiMH battery
Modular floppy drive (flexible bay swappable with CD-ROM)
Microsoft Windows 95 and MS Plus!
5-year/1-year Micron limited warranty

\$1,699

Bus. lease \$56/mo.

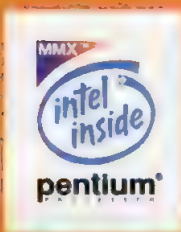
Packs A Punch.

Get some zing with the Micron™ TransPort™.

What's small, sweet and gives you a lot of punch?

A Micron TransPort notebook, of course. Our outstanding line of portable PCs offers impressive flexibility, tempting prices and the hottest features on the market.

High-end users will handpick the TransPort XKE. A true desktop replacement, we've loaded our XKE with a high performance graphics accelerator, active matrix screen, upgraded CD-ROM, tons of memory and more. Our TransPort XPE fits the bill if you're looking for a top-grade computer at home, office or travel. And our TransPort VLX offers flexibility and sleek styling for a more-than-palatable price.



Best of all, we back our products. Every day. When you buy Micron, you can custom configure your system to meet your needs, so it's homegrown, not mass-produced. When you buy Micron, you get the steadfast 24-hour customer service and support that we're famous for. And when you buy Micron, you get one of the best warranties in the business, from one of the best companies in the business.

If you're ready to pack a little punch, try a TransPort notebook.

MICRON POWER™ WARRANTY

5-year limited warranty on microprocessor and main memory
3-year limited parts-only system warranty (1-year for TransPort VLX)
1-, 2- or 3-year optional on-site service agreement for Micron desktop and server systems
30 days of free Micron-supplied software support for Micron desktop systems, 3 optional
network operating system incident resolutions included for Micron server systems
30-day money back policy
24-hour technical support

The foregoing is subject to and qualified by Micron's standard limited warranties and terms and conditions of sale. Terms and conditions of sale may vary for specific configurations. Copies of the limited warranties may be obtained on our Web site or by calling Micron.

CIRCLE 098 ON READER SERVICE CARD OR GO TO: WWW.PCMAG.COM/ProductLink

©1997 Micron Electronics, Inc. All rights reserved. Micron Electronics is not responsible for omissions or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice. Prices do not include shipping and handling and any applicable taxes. 30-day money-back policy does not include return freight and original shipping/handling charges. Access only to Micron-branded products and regions from date of shipment. All views are subject to Micron Electronics' current terms and conditions of sale. Base prices based on 30-month lease. The Intel Inside Logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. Other product names used.

For more information, visit our Web site at www.micronpc.com or call 800-295-0564.

Micron Sales Hrs: Mon-Fri 6am-10pm, Sat
7am-5pm (MT) Technical Support Available
24 Hours A Day, 7 Days A Week. Toll free from
Mexico: 95-800-708-1755 • Toll free from
Canada: 800-708-1758 • Toll free from
Puerto Rico: 800-708-1756
International Sales: 208-893-8970
International Fax: 208-893-7393



Call now to order.
800-295-0564
www.micronpc.com



CONFIGURED FOR YOUR LIFE

THE 90s:



SMALLER OFFICES.



LONGER HOURS.

After years of corporate downsizing, there's finally light at the end of the tunnel. And it's coming from the new DJ800 19" (18" VIS*), high-contrast monitor from MAG InnoVision.

That's because the DJ800 gives you everything you ever wanted in a large screen display. More real estate. Higher resolutions. And the envy of everybody you know.

Featuring an innovative dark-tint FST and advanced electron gun technology, the DJ800 delivers sharper images with higher contrast. Along with a 0.22mm horizontal dot pitch and pixel resolutions of up to 1600 x 1200. Plus, MAG InnoVision's exclusive one-touch JAG™ control and other features you've come to expect from the leader in color monitor technology.

Best of all, the DJ800 gives you all this for about what you'd expect to pay for a high-performance 17" monitor. And far less than what a 20" or 21" model would cost.

So check out the DJ800 today at your nearest MAG InnoVision Ultimate Reseller.

Then forget about climbing the corporate ladder and clamoring for that corner office. Set your sights on something bigger.

The new, high-contrast, 19" (18" VIS) DJ800 monitor from MAG InnoVision.

*Viewable Image Size.



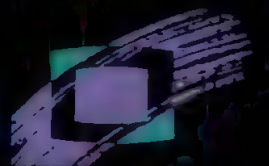
LOWER PAY.



BIGGER MONITORS.

THINGS HAVE NEVER BEEN BETTER.

MAG
INNOVISION



MAG InnoVision Co., Inc., 2801 South Yale Street, Santa Ana, CA 92704. Call: 714-751-2008 or 800-827-3998.
Fax: 714-751-5522. MAGic Fax-On-Demand: 714-751-0166. Web Site: www.maginnovision.com

©1997 MAG InnoVision Co., Inc. MAG InnoVision and the MAG InnoVision logo are registered trademarks and MAG is a trademark of MAG Technology Co., Ltd.

CIRCLE 69 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink



typist



writer

Free your hands. And your mind will follow.

Imagine using your computer without having to type. Unshackled from the keyboard, no longer forced to express your thoughts by using your fingers, you're free to sit back, relax, and express yourself in a more natural way. With your voice.

And now, we're pleased to bring you continuous-speech technology, with our new IBM ViaVoice.[™] Now you can talk *conversationally* to your PC, which transcribes what you say with amazing speed and accuracy. And that can turn mere typing into something considerably more inspired.

Voice-enabled applications and Web navigation Up to 140 words/minute dictation, up to 95% accuracy** 22,000-word vocabulary, customizable to 64,000



IBM speech recognition software titles start at \$49.95.* Stop by your favorite software retailer, or visit www.software.ibm.com/is/voicetype. To order directly, call 1 800 IBM-7235, ext. 5296.



Solutions for a small planet[™]

Letters

THE NEXT GENERATION

Most of us will figure out which processor we want, but the final choice will often be based on clock speed—for example, choosing between a Pentium Pro/180 or 200, a Pentium MMX/166 or 200, or most recently, a Pentium II/233 or 266. To make an informed consumer choice, I would have appreciated such a comparison in the June 10, 1997, story on Pentium II machines ("Pentium: Part II"). Instead, I found a somewhat confusing set of comparisons across processors and components, including very different video cards and disk technologies. In the end, I narrowed my choice down to a 233 or 266 and will have to rely on an earlier piece estimating the difference at 4 to 5 percent.

KENNETH P. O'BRIEN
via the Internet

While I found your article on the new Pentium II processors helpful, I believe points should have been deducted for the lack of motherboard expandability. For instance, some boards had a maximum capability of 128MB of RAM, which is poor for high-end graphics systems. In addition, the lack of PCI slots on systems designed for graphics, particularly video, is really bad. I noticed some that had only three available slots.

RON ROBERTSON
via the Internet

As a long-time AMD user, I was a little irritated at the hoopla that the release of Intel's Pentium II received in your publication. The release of the K6 was handled as an afterthought, especially when you consider the rather cool reception the Pentium II has so far received in most hardware-related Web sites I have seen.

LUIS CEDENO
via the Internet

ALTERNATIVE COMPUTING

Your First Looks article "David Meets Goliath" (June 24, 1997) was very timely. That issue of *PC Magazine* arrived the same day as my newly purchased CyberMax PowerMax A53. As a consumer, I want to say that your review was definitely right on the money. As a systems professional I wasn't as concerned about service and support issues from a smaller vendor, but I was still a little apprehensive when I first hit the power button. I was pleasantly surprised to find that not only did everything work perfectly, but the machine's performance is truly awesome.

SCOTT VASSAR
Omaha, Nebraska

While I appreciate your extra coverage of the AMD K6, I take exception to your comparison in "David Meets Goliath." You com-



"I found a confusing set of comparisons across processors and components."

pared the K6 with the Pentium MMX, even though its real-world 32-bit processor-specific test scores (CPUmark₃₂) were more than 20 percent higher than the corresponding Pentium MMX scores. Since other publications are comparing the K6 with the Pentium II (with the K6 winning some of the benchmark tests), I feel you should have done the same. This would assign the K6 to its rightful cutting-edge market segment.

VINCE FREEMAN
via the Internet

Though the review you speak of discussed the K6 only in relation to the Pentium MMX, we compared AMD's newest processor with the Pentium II in our previous issue ("Pentium: Part II," June 10, 1997). The chip is indeed adept at running 32-bit code, but it still can't match the performance of the Pentium II under Windows NT. Under Windows 95, comparisons with both the Pentium II and the Pentium MMX are much more favorable. Windows 95 may not be "cutting-edge," but it is still the operating system that most home and corporate users are running.—Ed.

SHYING AWAY FROM K6?

The May 27, 1997, Trends/PCs article "AMD's K6 Arrives" ends with the somewhat simple statement that PC vendors are reluctant to use the K6 in their systems. You might as well have added that most motherboard manufacturers are just as reluctant to produce K6-compatible boards. Without the slightest doubt the K6 is an enrichment to the processor market, making top performance available to the end user at sensible prices. It

is frightening that Intel will stop at almost nothing to scare anybody away from a competitor's product.

WILLEM M. VAN DE VELDE
via the Internet

PROCESSOR CHOICES

I'm glad to see that Bill Howard included some of the other processors in his column "What's the Best CPU?" (June 10, 1997) instead of just Intel products. I fully agree with him about AMD's K6 being a force to be reckoned with: It has speed, price, and a proven CPU socket (Socket 7) in its favor over the Pentium II. AMD chips have lifetime warranties, and Intel chips have about a one- or two-month warranty. That really tells a story of quality when a company can offer a cheaper product, a better warranty, and competitive performance. Thank you for writing a column that is geared less toward people with bottomless pits for wallets and more toward the people who want to get the most bang for their buck.

RICKY HARDT
via the Internet

Thanks for Howard's column "What's the Best CPU?" It highlights how fast technology is changing: The fastest CPU available only half a year ago is now a low-end CPU. How will consumers keep up?

JOSEPH MADDISON
Minneapolis, Minnesota

E-COMMERCE SOLUTION?

In response to Jim Seymour's column "Whom Can You Trustmark?" (June 24, 1997), I thought of an easy method to ensure that no one will steal your E-cash account number: Never use the same number twice; instead, use an E-check. Simply put, each site that sells products would have its own identification number, or signature. When a visitor wishes to make a purchase, a browser plug-in would get the signature from that site and the total amount for the purchase. Then, when it has the Web site's signature, the amount of money the site will receive for the purchase, and the customer's account number, the plug-in can contact the credit card company's site and receive a special, one-time E-check that only a company bearing the correct pin number could cash. The plug-in would then relay the E-check back to the Web site.

ANDREW D. RONDEAU
via the Internet

VOODOO ECONOMICS

While I enjoyed your annual graphics card and 3-D card roundup, I was disappointed to see no mention of any boards based on the 3Dfx Voodoo chip set, such as the Diamond

100 REASONS WHY

Word Processor Features	Corel® WordPerfect® 8	Microsoft® Word 97
Support for Intel MMX™ Technology	✓	no
Libraries		
Clipart	10,000+	3,000+
Photos	250	140+
Interface		
Shadow Cursor	✓	no
Tile documents vertically	✓	no
Reveal Codes	✓	no
Save workspace	✓	no
Search for any codes	✓	no
Application bar	✓	no
Context-sensitive property bars	42	13
Internet*		
Automatic natural language hypertext	✓	no
Corel Barista™ (for Java™ publishing)	✓	no
Java applets	✓	no
Formatting Tools		
QuickFonts/font preview	✓	no
Spell check drop cap words	✓	no
Guidelines	✓	no
Font preview from drop-down list	✓	no
Styles can include text and graphics	✓	no
User-defined borders and fills	✓	no
Image rotation	✓	no
Make It Fit™ to expand documents	✓	no
Customizable Make It Fit options across multiple pages	6	none
Parallel columns	✓	no
Captions on any side of image	✓	above and below
Undo levels	300	100
Multiple character drop caps	50	1
Tables		
Row and column indicators	✓	no
Automatic data fill (QuickFill)	✓	no
Format painter tables	✓	no
Automatic calculation	✓	no
Formulas function across tables	✓	no
Number of formulas	98	18
Long Documents		
Create new lists	✓	no
Expand/contract subdocuments individually	✓	no
Predefined document summary fields	51	27
Proofing Tools		
Combined Spell Checker/Thesaurus/Grammar	✓	no
Prompt-As-You-Go	✓	no
Document dictionaries and editable main dictionary	✓	no
Automatic sentence rewrite (PerfectSense™)	✓	no
SGML		
Import/export	✓	no
SGML editing and validation	✓	no
Document creation tools based on DTD	✓	no
Transitioning		
Backward compatibility	✓	no
Convert Corel® WordPerfect® for DOS macros	✓	no
Use existing Corel WordPerfect for Windows® macros	✓	no
Corel WordPerfect for DOS keyboards	✓	no
Convert Corel WordPerfect 6.x files	✓	import only

Available now! To buy Corel WordPerfect Suite 8, contact your local reseller.

Please visit our Web site for additional information.

*Internet connection required

†CorelCENTRAL 8 is not included in the current release of Corel WordPerfect Suite 8. Customers will receive a voucher to obtain this application upon its release (summer 1997). Shipping and handling charges will apply.

Copyright © 1997 Corel Corporation. All rights reserved. Corel, WordPerfect, Quattro, Presentations, CorelCENTRAL, Corel Barista and the Corel balloon logo are trademarks or registered trademarks of Corel Corporation or Corel Corporation Limited. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, MMX, the MMX logo and Pentium are trademarks or registered trademarks of Intel Corporation. Netscape Navigator and Netscape Communicator are trademarks or registered trademarks of Netscape Communications Corporation. Java is a trademark of Sun Microsystems, Inc. All other product, font and company names and logos are trademarks or registered trademarks of their respective companies.



Corel, Official World Title Sponsor of the COREL WTA TOUR



COREL®
www.corel.com

Call now for faxed literature!
1-613-728-0825 ext. 3080
Document # 1383

WPA-0044US

COREL® WORDPERFECT® SUITE 8

BEATS Microsoft® Office 97

WordPerfect Features	WordPerfect 8	Microsoft Word 97
WYSIWYG editable view	✓	no
Cell reference checking	✓	no
QuickCell™	✓	no
Copy, cut, paste discontinuous ranges	✓	no
QuickCharacter™ insert	✓	no
Consolidation, budget and scenario experts	✓	no
Sort reuse list	✓	no
QuickType™ formulas	✓	no
Edit headers/footers onscreen	✓	no
WordPerfect (including tables) and Quicken	✓	no
Quattro® (WK1/ WK2)/Quattro Pro Notebooks (WB2, WB3) imports	✓	no
Formula Composer™	✓	no
Fit-As-You-Go (no "*****")	✓	function wizard
Core @functions	504	limited
		400

Presentation Features	Corel® Presentations™ 8	Microsoft® PowerPoint® 97
Support for Intel MMX™ technology	✓	no
Publish to Java (Corel Barista)	✓	no
QuickKeys keystroke actions (such as go to another slide, launch an application, play a sound, or even link to a URL)	✓	no
Add multiple slides simultaneously	✓	no
Import outlines into organization charts	✓	no
Customizable Background Gallery	✓	no
Slide navigation tabs	✓	no
Chart styles	✓	no
Range Highlighter used in datasheet	✓	no
Sort pie slices	✓	no
Separate drawing mode	✓	no
QuickWarp objects	✓	no
Slide transitions	120	41
Blend objects together	✓	no
Place/Resize/Rotate chart	✓	no (must separate into objects)
Gradient fill (text and objects)	✓	objects only
Quick 3D any image	✓	drawing objects only
Data chart functions (equations)	16	7

Communication Features	CorelCENTRAL™ 8	Microsoft® Outlook 97
Create a planner containing a calendar and multiple card files	✓	no
Create an all-day, multiday calendar	✓	no
Add freeform notes to calendar	✓	no
Add custom fields to address book	✓	no
Schedule group events over the Internet	✓	no
Assign To Do items over the Internet	✓	no
Follow e-mail threads	✓	no
Compose content-rich HTML messages for assigned To Do items	✓	no
Type personal To Do items directly in list	✓	no
Use the Internet for long distance calls	✓	no
Edit address book entries in view mode	✓	no
Access Internet newsgroups and corporate discussion groups using mailbox interface	✓	no
Conduct and save a "live" chat session	✓	no
Click on hyperlinks to go to linked information	✓	no
Organize cards into groups	✓	no
Participate in collaborative Internet browsing	✓	no
Sort address book on any field	✓	no
Surf the Internet using an integrated browser	✓	no
Create simple, flexible card files	✓	no
Link cards to documents or applications	✓	no
Have information "pushed" to you for instant access	✓	no

"WordPerfect . . . offers a wider selection of utilities in the box — and costs \$200 less."

PC Computing, July 1997

Letters

Monster 3D. Although these add-on cards are not graphics cards, their 3-D performance is almost unparalleled in the home market, and their relatively low cost makes them a viable solution for home users looking to increase their game play. At the very least, you should have included a sidebar.

STEVEN B. DICKENSON, JR.
via the Internet

Hopefully, you will produce a better roundup of 3-D boards in the future that shows all of the 3-D boards on the market—not just the ATI, Diamond Stealth, and Rendition. You might also want to consider more than just straight 3-D performance in your reviews. Most of the people who buy these 3-D boards are going to want to know what games and applications can take advantage of the technology. Right now, the Rendition and Voodoo boards are really the only ones to consider for the gamer or the average PC user who wants the most supported software.

STEVE WAKE
via the Internet

I can't believe that you didn't even mention the word *Voodoo* in your article.

CHRIS HEBERT
Houston, Texas

We looked at 2-D and 3-D graphics accelerators for the business user, staying away from the purely game-oriented 3-D-only add-in cards. That excluded the Diamond Monster 3D. But we were aware of the 3Dfx chip set's potential, so we tested the 2-D/3-D card that was farthest along, the Hercules Stingray 128/3D, in beta. We required each board to

HOW TO CONTACT US

We welcome your comments and suggestions. Please send Letters to the Editor via

E-MAIL pcmag@zd.com

FAX 212-503-5799

MAIL Letters, PC Magazine, One Park Ave., New York, NY 10016-5802

COMPUSERVE To reach individual editors as listed on ZDNet, type GO PCMSTAFF.

All letters become the property of PC Magazine and are subject to editing. We regret that we cannot answer letters individually. To send submissions for PC Solutions, please see the sidebar "How to Contact Us" on the last page of that column.



CORRECTIONS AND AMPLIFICATIONS

In the July, 1997, Trends/Software story "Big-Business Bookkeeping" (page 36), we published the wrong Internet address for Scala North America. The correct address is www.scala-na.com.

In our July, 1997, First Looks article "The New Subnotes," Thom O'Connor should have been credited as the photographer.

In the sidebar "DMI, TCO, COA: Not Just Acronyms Anymore" (page 104) in our June 24, 1997, article "MMX Means Business," we incorrectly stated that DMI 2.0 should be finalized in the fall of 1997. The specification was released in April 1996; this fall, we will begin to see its implementation.

have a 2-D Windows 95 driver; this left out other 3-D specialty boards, such as those from AccelGraphics and Dynamic Pictures, whose 3-D focus is on OpenGL.—Ed.

COMPLETE SCRIPT

I thought your PC Tech article "VBScript 2.0 and JavaScript 1.2" (June 10, 1997) was excellent. You covered everything I wanted to know about Web scripting. Thanks for making so much sense and taking the time to explain what no other article has done before.

ROBERT PENDLETON
via the Internet

NO SCARECROWS

In your June 10, 1997, article "Partitioning Your Hard Disks" (PC Tech/Tutor) your message to the reader is that partitioning is a "no-brainer." In many cases, this may be true. However, partitioning is not the only technique that can be used to save wasted disk space caused by cluster size limitations. You should provide your readers with other options, giving sufficient information that the reader can make an intelligent decision.

NELSON CROWLE
via the Internet

SHADY OUTLOOK

Thank you, John C. Dvorak, for expressing the opinion that Microsoft Outlook isn't ready for public consumption (Inside Track, June 10, 1997). I waited with great anticipation for Outlook, expecting it to solve the fragmentation problems in my PIM, e-mail, and fax functions. Once it came out I visited the Outlook newsgroup every day for a month to find all the workarounds and tried to understand the confusing terminology Microsoft uses for its various components. Finally I realized that, happy as I was hacking away at Outlook on my computer, I was a month behind in my real work. Microsoft released Outlook in a beta phase, and I paid the company to do it.

JIM THOMPSON
via the Internet

I couldn't agree more with Dvorak's comments about Microsoft Outlook. It ran so slow on my 200-MHz Pentium that I thought the system had locked up. Outlook always tried to connect to my company's dial-up network

e-mail every time I wanted to check my Internet e-mail. When I finally uninstalled Outlook, I could no longer start my Internet Mail program from within Internet Explorer. I have to run it from the Start button.

ROB DEBELAK
via the Internet

I'm not a Microsoft evangelist, but Outlook 97, along with Exchange, is a cool and competent product. For example, it takes me only 30 seconds to load Outlook from my local server, make an Internet connection via ISDN to my office Exchange server, and have my in-box fully displayed. You are right that Microsoft misleads you and doesn't provide full documentation. However, I find that the application integration is the best I've seen from Microsoft in the past ten years.

JOHN RUTKOWSKI
Prospect Park, Pennsylvania

TO EACH HIS OWN

I enjoy browsing the Web and locating useful or entertaining information, but I strongly oppose Michael J. Miller's statement, "One nice thing is that you can view your local hard disk and server the same way you view the Internet..." ("Remember the Web?", June 24, 1997). I don't want my browser to be a glorified file manager. I also don't want to have to create my own local Web page for each application or have my new applications bloated with HTML.

MIKE LEWIS
via the Internet

DEFINING THE COSTS

Your review of network printers ("Print! Don't Copy," June 10, 1997) was disappointing. I don't think I am alone in my opinion that the true cost of a machine is not its acquisition cost but total operating cost, including consumables. You should have analyzed these aspects more. I was amazed to see virtually no mention of the fact that in each size group there was a machine with a cost per page of less than half a cent. Your picks were among the highest per page to operate. I'm sure they yield great output, but don't machines with lower operating costs that can pay for themselves in a few months count for something?

JOHN D. MYERS
Manchester, Maryland

Forget all the promises
about 100Mbps costing
the same as 10Mbps.



It's already happened.

\$135

**CreditCard
Ethernet 10/100 Upgradable**

This 10Mbps Ethernet PC Card is upgradable to 100Mbps with the simple purchase of a new adapter cable.

\$155

**CreditCard
Ethernet 10/100 Ready**

Connects notebooks to either 10Mbps Ethernet or 100Mbps Fast Ethernet networks. Seamless 10Mbps and 100Mbps connectivity means you won't have to upgrade when you move to Fast Ethernet.



\$179

**CardBus
Ethernet 10/100**

This 32-bit CardBus adapter connects CardBus-equipped notebooks to 10Mbps and 100Mbps Ethernet networks with the fastest notebook-to-LAN connection available, closing the performance gap between notebooks and desktops.



Our proposition is simple: 100Mbps adapters for virtually the same price as 10Mbps adapters.

The CreditCard Ethernet 10/100-Ready prepares you for 100Mbps at nearly the price of a 10Mbps-only card. If Fast Ethernet isn't in your plans yet, the CreditCard Ethernet 10/100-Upgradable gives you great 10Mbps performance now, with 100Mbps when you're ready for it.

And for the fastest performance, the CardBus Ethernet 10/100's 32-bit, PCI-based design makes CardBus-equipped notebooks perform like desktop systems.

Whatever your situation, Xircom's award-winning Fast Ethernet family can give you the speed you need now, plus the speed you need for the future, at today's 10Mbps prices. Call us at 800-438-4526, or visit the Xircom Web site at www.xircom.com/100a. For multi-pack and volume pricing call your authorized Xircom reseller.

Xircom
The Mobile Networking Experts.

A MOTHERBOARD DOESN'T
CARE WHO YOU ARE, WHAT
YOU NEED, OR IF YOU EVEN
KNOW WHERE IT IS.





We'll show you. A motherboard is made of metal, plastic, and solder—materials which have yet to show signs of human compassion. It doesn't care if you need to upgrade it, or get at anything around it. To help out, AST® introduces the FlexCassis design—a feature that allows easy access to the system's major components in seconds. No tools required. Since even the best technology will one day need upgrading, AST is here to help you do it right. For more information about AST Bravo PCs featuring Intel® Pentium® processors, call 1-800-945-2278.

Bravo (Desktop and Mini-Tower)		
200 MHz Intel Pentium processor with MMX™ technology	2 MB graphics memory expandable to 6 MB	512 KB L2 cache
3 GB UltraDMA 33 hard disk drive	Manageability software utilities • Intel LANDesk™ 3.0 • McAfee® VirusScan™ and WebScan™	16X maximum speed CD-ROM
Integrated 10/100 Ethernet		Includes choice of Microsoft® Windows® 95 or Windows NT® 4.0

AST.
COMPUTER

Working for your business.™

Trends

Order Up!

Compaq's new strategy cuts PC prices across the board.

The industry is calling it Texas Earthquake II. Six years after dropping the premium-pricing model and rising to the top of the PC market, Houston-based Compaq Computer Corp. has revamped its sales strategy once again. The company's new Optimized Distribution Model (ODM), announced in July, is a significant step toward the direct strategy popularized by Dell Computer and Gateway 2000. ODM isn't a direct model per se (an individual end user won't be able to phone Compaq and ask for a custom-made machine), but it should increase Compaq's efficiency and decrease costs. The benefit for PC customers is reduced pricing on business machines from Compaq and its competitors, which are already trying to keep pace.

The direct sales model, which was invented by Michael Dell in his University of Texas dorm room circa 1982, is now of major import in the PC industry. With Dell and Gateway claiming 8 and 7 percent market shares respectively, both Packard Bell NEC and Sony have announced plans to move at least a portion of their commercial products to the direct channel. Earlier in the year, Compaq had hoped to do the same by merging with Gateway and making use of an existing direct infrastructure. According to an article in *Time* last May, Gateway CEO Ted Waitt backed out of a reported \$7 billion deal at the eleventh hour and left Compaq to change its sales model on its own.

Compaq has always sold through an indirect channel, a network of resellers and dealers that interact with end users. ODM keeps this channel in place but changes the way channel partners interact with Compaq. The first phase of ODM, known as Build-to-



Order (BTO), has already begun in North America and will reach other geographic regions as the year progresses. Through BTO, Compaq receives requests from its channel partners and manufactures systems directly from those requests.

Essentially, channel partners order only the machines that they plan to sell, only when they want to sell them—an arrangement that reduces Compaq's costs by decreasing the time between the building and the selling of a machine. Compaq can also take advantage of component price reductions as they happen. Machines don't sit on shelves for months at a time, losing value as they sit. Resellers, once allowed to return un-

sold machines to Compaq, must sell or absorb the cost of all built-to-order systems (unless a system was faulty upon arrival).

CHAIN REACTION

Anticipating such cost reductions, Compaq has already cut prices on its U.S. business desktops by as much as 22 percent. A low-end Deskpro 2000 with a classic Pentium and a 1.2GB hard disk sells for \$999. Seven new built-to-order Deskpro 2000 machines, equipped with MMX Pentiums ranging from 166 to 233 MHz, are now from \$1,119 to \$1,899. Similarly configured Deskpro 4000 systems, which offer Ethernet controllers and additional management software, are \$1,389 to \$2,089. To accommodate Build-to-Order, Compaq has already begun to decrease the number of Deskpro models, develop modular designs, and use a common motherboard for both desktop and mini-tower systems.

Ripple effects were evident before BTO was even announced. One day prior to Compaq's press conference, Hewlett-Packard said it would reduce prices on its Vectra PCs by up to 25 percent within the week. Vectras equipped with 233-MHz MMX Pentiums now sell for as low as \$1,590, and 200-MHz classic Pentium machines begin at \$1,020. Major manufacturers such as Dell and IBM should soon follow suit with their own cuts.

Though Hewlett-Packard also brought down prices on its Pentium II lines, the summer's largest price cuts will likely affect classic Pentium and MMX Pentium machines. Not only

are these the systems targeted by Compaq, but Intel was rumored to be planning a major fifth-generation CPU price cut as we went to press. According to industry sources, Intel planned to drop MMX Pentium prices by as much as 50 percent and some classic Pentium prices to below \$100 on August 1. You still can't buy a PC directly from Compaq, but PC prices are more competitive than ever.—Cade Metz



Compaq systems

Compaq Deskpro 2000 with 166-MHz classic Pentium, 1.2GB hard disk, 16MB RAM **\$999**

Compaq Deskpro 2000 with 166- to 233-MHz Pentium MMX, 2.1GB or 3.2GB hard disk, 16MB-32MB SDRAM **\$1,119-\$1,899**

Compaq Deskpro 4000 with 166- to 233-MHz Pentium MMX, 2.4GB or 3.2GB hard disk, 16MB-32MB SDRAM, 16X Max CD-ROM drive **\$1,389-\$2,089**



Hewlett-Packard systems

HP Vectra 520 with 166-MHz classic Pentium, 1.2GB hard disk, 16MB RAM **\$999**

HP Vectra VL with 166- to 233-MHz Pentium MMX, 2.5GB hard disk, 16MB-32MB RAM **\$1,217-\$1,594**

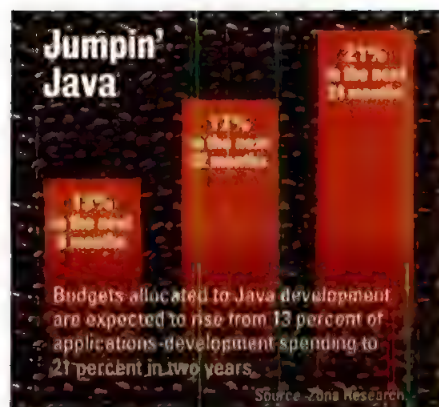
HP Vectra XA with 166- to 233-MHz Pentium MMX, 1.6GB-2.5GB hard disk, 16MB-32MB RAM **\$1,432-\$2,185**

Wanted: Full-Time Java Developers

Corporate America invests in Java.

Web sites may be wiggling and waving, thanks to nifty Java applets, but are companies using Java to develop truly useful corporate applications? According to the results of a recent survey by Zona Research, the number of enterprises with widespread deployment of Java applications is limited, but companies are investing in the labor and resources needed to build heavy-duty applications, for services ranging from online banking to automated package routing.

"It's clear that Java is on the enterprise radar," says Clay Ryder, chief analyst at Zona Research. Venture capital firms are eager to invest in Java start-ups—Kleiner Perkins Caufield & Byers has a "Java Fund"—and companies are pumping up their budgets for Java development. Zona Research's survey of 279 information technology professionals in Fortune 1000 companies found that half are



already using Java, and other half plan to do so within the next 12 months.

According to the survey, the portion of applications development spending allocated for Java-related activities will rise from nearly 13 percent during the next 6 months to 21 percent within the next 24 months. And the average "man-months" spent on Java development will rise from 12 during the next 6 months to 100 in the next 24 months. Also, 60 percent of the respondents plan to have from one to ten full-time Java developers within the next one to two years.

Programmers want Java, and their bosses are listening. The survey shows that programmers' interest in Java development—and companies' interest in attracting programmers—are key factors driving the deployment of Java. But one weak link could be the industry-wide shortage of programmers as the number of graduates in computer science drops precipitously, a trend that the Stanford Computer Industry Project is studying.—*Carol Levin*



When 200 Milliseconds Matter



FOR PC MAGAZINE'S Web server evaluation "Beyond Unix" for our issue of May 27, 1997, we tested 16 Web servers using the client WebBench 1.1, which Ziff-Davis Benchmark Operation (ZDBOP) created. We expected great things from our Netscape/Solaris solution, because of performance claims from Sun Microsystems. But in the end, we—and some Sun support technicians—were left scratching our heads at the downright strange Solaris test results.

In analyzing Internet (TCP/IP) traffic between the Solaris Web server and the Microsoft Windows-based WebBench client, we found a 200-millisecond delay between each client request and the successful exchange of any data. In the WebBench world, where a server must turn around 1,000 or more requests per second to be competitive—that is, at least 1 request per millisecond—a 200-ms delay dashes any hope of keeping up with the top performers.

A CASE OF IDLE STACKS

After reproducing the test results on several Sun servers, we decided to get to the bottom of the problem. As it turned out, the issue was a setting for the TCP/IP parameter that tells the stack (the code that tells how to transmit data) how many packets it should send and receive during start-up before waiting for an acknowledgment. (TCP/IP experts know this parameter as the "congestion window.") The initial Sun congestion window was set to 1; the Microsoft congestion window was set to 2. As a result, the server sent the

client one packet and waited for an acknowledgment, but the client expected two packets, so the two stacks sat idle while waiting for each other to do something. Eventually, the systems timed out, the server retransmitted the data, and the stacks synched up.

Sun never saw this problem in its lab. Why? Because it tested only with Sun clients, not with Microsoft clients.

Is there a right implementation in this case? The purist would argue for Sun's approach to the initial congestion-window setting, since that approach most closely follows the TCP specification. But the pragmatist would argue that Microsoft is in the right, because most TCP/IP stacks on the market set their initial congestion windows to 2—as we confirmed by testing with a diverse array of software products from Digital, Novell, and WRQ.

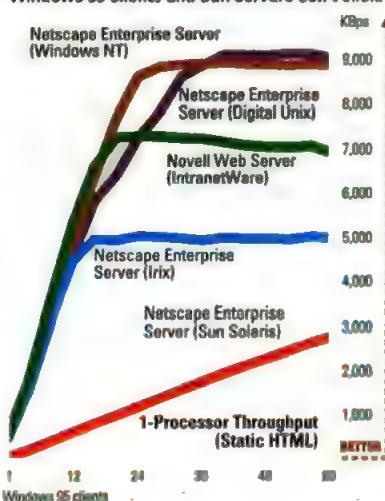
In the end, the strength of the Microsoft client market endured. Sun has announced that it will release a patch to match the Windows-based TCP/IP implementation. (The company has not given a specific date for availability.) If you run Sun Solaris OS or if you're planning to buy it in the near future, be sure to check the Sun Web site for the patch.

The real issue, however, is not which company has the bet-

ter stack implementation. The lesson is that network managers need to test Internet software with as many hardware and software combinations as possible. After all, the Internet is not a controlled lab; it's chaos. Exhaustive interoperability testing will help to ferret out all of those unexpected glitches that are still lurking in the dark corners of the Web.—*Jeff Downey and Chris Lemmons*

Sun Burned

Windows 95 clients and Sun servers don't click.



Where Microsoft Wants to Go Today

R & D leader Nathan Myhrvold outlines intriguing new research efforts.

In its advertisements, Microsoft asks, "Where do you want to go today?" When *PC Magazine* wants to find out where Microsoft wants to go today, we ask Chief Technology Officer Dr. Nathan Myhrvold what he's working on. Myhrvold is responsible for strategic and business planning for Microsoft, and he runs the company's Advanced Technology and Research Group, overseeing an annual \$2 billion research and development budget. Here's what Myhrvold has on his mind.

ON MICROSOFT'S RESEARCH EFFORTS:

"We're the only software-only company to support this amount of basic research. We're going to triple in size from 200 to 600 scientists in the next couple of years and branch out geographically. We've already gone outside the U.S. to set up a lab in Cambridge, England, and we're looking for other locations. It's extremely exciting to be doing something contrarian, growing while so many other organizations are downsizing."

ON SPEECH RECOGNITION

"It's not ready for prime time, but one day it will be hugely successful. The problem with speech recognition is that 95 percent accuracy isn't good enough. I said 5 years ago that good products were still 5 years away, and today I'll say it again: Good products are still 5 years away. Even if they take 25 years they'll still be worth it, but I always say 5 years because anything longer sounds like infinity."

ON PATENTS:

"My personal position is that we'd be better-off without software patents. Thousands of software patents out there are probably bogus, but it's tough to know what to do about that. For now it behooves us to keep filing patents. On the hardware side it's easy for large organizations to cross-license with

each other, but that doesn't work in software, because so many patents are held by individuals and you can't really cross-license on a small scale. We've paid hundreds of millions of dollars on claims that, in my opinion, are bogus."

ON THE FUTURE OF INTERFACES:

"We're really interested in multimodal input and in ways to incorporate 3-D and multimedia into how people interact with their computers. User interfaces are great for a research lab, because they are bottomless pits. You can study them forever."

ON "INFOGLUT":

"People say that information overload is a product of the digital age, but way too much 'ana-

log' information was always around, too—you could never read every book. The difference is that when the information is digital, you have access to so much more of it. Now that everything's online, we just worry about infoglut more."

“Speech recognition isn't ready for prime time, but one day it will be hugely successful.”



JAKE KIRCHNER

The CDA Is Dead. How Come I'm Not Happy?

When the U.S. Supreme Court struck down the bulk of the Communications Decency Act as unconstitutional, the news reports described First Amendment supporters and cyberspace zealots as jubilant. I, a committed free-speech champion by training and a cyberspace enthusiast of long standing, was relieved but hardly happy.

It's not that I thought the CDA was a good law. It clearly was not. But I recognized in it an attempt by reasonable people to deal with an unprecedented situation. In the space of a few years, the world has changed remarkably because of the Internet. Suddenly our children have access to almost the entire store of the world's information and knowledge from their own homes. They also have more unfettered access to harmful, misguided, inaccurate, and dangerous material than any generation before. And nothing in our experience has prepared us to deal with this situation.

It's no wonder, then, that Congress overstepped its bounds in trying to protect our children from the harmful material on the Internet. And it's no wonder that Congress has not given up that fight. The Supreme Court gutted the CDA only because it was overreaching, inadvertently outlawing types of speech that the Constitution protects. The federal and state governments will still be able to regulate material on the Web. Dozens of states are working on such plans, and a number of new CDA-type bills are pending in Congress.

As much as I cringe at the thought of these technologically unsophisticated legislators casting their disapproving eyes on the Internet,



I still hope they can find a way to deal with this problem.

When people tell you that pornography on the Web is available only to those with credit cards, don't believe them. There's plenty of filth out there for free. But the biggest problem is the absence of differentiation among the types of information available to our children via the Web. There's no way for them to tell the good from the bad. The racists, the cultists, the Holocaust deniers, the paranoid conspiracy buffs, the militia gun nuts—they all have access to our children's attention equal to that of

our society's religious and academic leaders. In the past, you didn't worry that your child could wander into an adult video store or that a visit to the library would expose him to hate literature and the blandishments of suicide cults. Today we don't have that peace of mind.

The software that limits access to certain Web-based information is in its infancy. It screens out useful information and doesn't address the problem of hate literature and just plain inaccurate information. As the alternative, we have nothing better than constant admonitions to be aware of what our children are doing with their computers. We can't begin to police our children's Web wanderings effectively.

My advice? When people tell you to fight censorship and rely on your ability to watch what your children are doing with their computers, tell them to stuff it. The cyberspace censorship issue is just beginning to take shape. I become more sure by the day that hiding behind the First Amendment is not the answer. For now, my best advice is to pay attention and get involved in the debate. We all have a lot at stake.

**We've contributed
several advances to
the notebook PC.**



Like inventing it.

NEC also introduced the first color laptop. The first notebook with an active matrix display and modular components. And one of the first portables with MMX™ technology. What's more, we offer the most extensive selection of notebooks available.

But, then, innovation is a way of life around here.

Consider our approach to direct sales. NEC NOW™ connects you with System Consultants who have the expertise to match the right notebook to your unique situation. And NEC NOW is backed by the resources, quality and dependability of one of the world's largest computer companies.

Why NEC NOW?

- The security of partnering with a company known for its technological innovations.
- The flexibility of ordering direct or through a reseller.
- The expertise of System Consultants.
- The immediate availability of competitively priced products.
- The resources of one of the world's largest computer companies.



So when you need a notebook PC, call the company that invented it. And reinvented direct sales.



Greater availability because NEC is one of the world's largest manufacturers of TFT LCD displays.

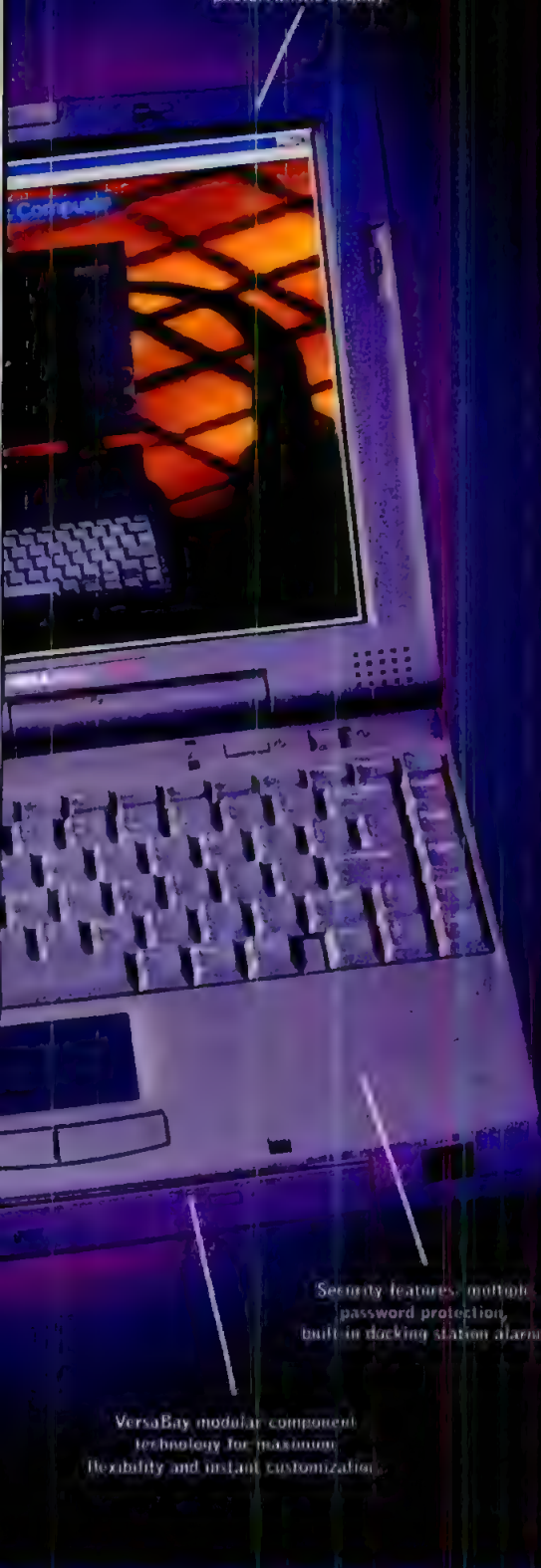


Intel® 166MHz Pentium processor with MMX technology.

**BUILT
TO
ORDER**

©1997 NEC Computer Systems Division, Packard Bell NEC, Inc. NEC, Versa, and MultiSync are registered trademarks. VersaBay, A700, A500, C500, ESM, PortBar, MiniDock and Express5800 are trademarks, and VersaNote is a service mark of NEC Corporation, all used under license by Packard Bell NEC, Inc. Direction, VersaNote, VersaExec, and MultiSync are trademarks and NEC NOW is a service mark of Packard Bell NEC, Inc. Leasing based on typical 36-month lease with purchase option. Other lease options may be available, and are arranged by third party leasing company to qualified customers. Prices do not include shipping or applicable sales tax, and are in the U.S. only and are subject to change without notice. Products and specifications are subject to change without notice. *Product is 56Kbps capable. However, due to FCC rules which restrict power output of the service providers' modems, current download speeds are limited to approximately 53Kbps. Actual speed may vary depending on line conditions. MS, IntelliMouse, Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. NetWare and Novell are registered trademarks of Novell, Inc. The Intel Inside logo, LANDesk and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. All other trademarks and registered trademarks are property of their respective owners.

First to offer VersaVision™ True Color TFT color. Displays 16.7 million colors at 640 X 480 resolution for a brighter, richer, photorealistic display.



Security features: multiple password protection, built-in docking station alarm

VersaBay modular component technology for maximum flexibility and instant customization

NEC Versa® 6060 Series High performance desktop applications

Common Features: PCI Bus with 128-bit Graphics Accelerator • 32-bit CardBus Support • 2MB VRAM • 16-bit Stereo Sound with 3D Spatializer Technology • USB Port • VersaBay™ II Option Slot Accepts CD-ROM, Floppy Drive (both included), Optional 2nd Hard Drive and 2nd Battery • Lithium Ion Battery • Upgradeable 3-Year Limited Warranty

Versa 6060

- 166MHz Pentium® processor with MMX technology
- 12.1" SVGA Active Matrix TFT Color Display
- 48MB RAM/ 2.1GB Hard Drive/20X max CD-ROM
- U.S. Robotics® x2™ XJACK® 56Kbps* Fax Modem
- Microsoft® Windows NT® 4.0 with Free Telephone Support
- Optional NEC Docking Station 6000 Plus, add \$899
- Optional 2nd Lithium Ion Battery, add \$199

\$4099

Business Lease: \$143/mo.

Versa 6060

- 166MHz Pentium processor with MMX technology
- 12.1" SVGA Active Matrix TFT Color Display
- 16MB RAM/ 2.1GB Hard Drive/20X max CD-ROM
- Upgrade to 48MB RAM, add \$299
- Optional 2nd Lithium Ion Battery, add \$199
- Optional U.S. Robotics x2 XJACK 56Kbps* Fax Modem, add \$199
- Optional NEC MiniDock™ 6000, add \$499

\$3499

Business Lease: \$126/mo.

NEC Versa 2700 Series All-in-one convenience at a sensible price

Common Features: PCI Bus with 128-bit Graphics Accelerator • 256KB L2 Pipeline Burst Cache • 32-bit CardBus Support • 2MB VRAM • USB Port • 56Kbps* Integrated Modem • Stereo Speakers and Subwoofer with 3D Stereo Sound • Upgradeable 1-Year Limited Warranty

Versa 2760MT

- 166MHz Pentium processor with MMX technology
- 12.1" SVGA Active Matrix TFT Color Display
- 16MB RAM
- Built-in 2.1GB Hard Drive, 16X max CD-ROM, 1.44MB Floppy Drive, and Lithium Ion Battery
- Upgrade to 80MB RAM, add \$699
- Optional Lithium Ion Battery, add \$199
- Optional NEC Versa PortBar™ 2700 Port Replicator, add \$159

\$3299

Business Lease: \$119/mo.

Versa 2730M

- 133MHz Pentium processor with MMX technology
- 12.1" SVGA DSTN Color Display
- 16MB RAM
- Built-in 1.44GB Hard Drive, 16X max CD-ROM, 1.44MB Floppy Drive, and NiMH Battery
- Upgrade to 32MB RAM, add \$159
- Optional Lithium Ion Battery, add \$199
- Optional VersaNote™ Ballistic Nylon Carrying Case, add \$69

\$2399

Business Lease: \$86/mo.

NEC Versa 6200 Series The ultimate power notebooks

Common Features: 64-bit CPU and 32-bit PCI Bus Architecture • 32-bit CardBus Support • 2MB VRAM • 16-bit Stereo Sound with 3D Spatializer Technology • VersaBay II Option Slot Accepts CD-ROM, Floppy Drive (both included), Optional 2nd Hard Drive and 2nd Battery • Lithium Ion Battery • Upgradeable 3-Year Limited Warranty

Versa 6200MX

- 13.3" XGA Active Matrix TFT Color Display
- 166MHz Pentium processor with MMX technology
- 64MB RAM/ 3GB Hard Drive/10X avg CD-ROM
- "...best multimedia performer..." *Mobility Computing & Communications* (July 1997)
- Upgrade to 128MB RAM, add \$699
- Optional 2nd Lithium Ion Battery, add \$199
- Optional U.S. Robotics x2 XJACK 56Kbps* Fax Modem, add \$199
- Optional NEC MiniDock 6000, add \$499

\$4999

Business Lease: \$175/mo.

Versa 6200MX

- 13.3" XGA Active Matrix TFT Color Display
- 166MHz Pentium processor with MMX technology
- 32MB RAM/ 2.1GB Hard Drive/10X avg CD-ROM
- Upgrade to 64MB RAM, add \$299
- Upgrade to 3GB Hard Drive, add \$299
- Optional 2nd Lithium Ion Battery, add \$199
- Optional U.S. Robotics x2 XJACK 56Kbps* Fax Modem, add \$199
- Upgrade to MS Windows NT 4.0, add \$99

\$4399

Business Lease: \$154/mo.

To order, get a free catalog or find your nearest reseller call: Mon-Fri 9am-5pm EST

1-888-8-NEC-NOW

Dept. No. PM528A www.necnow.com

NEC

NEC Direction™ PCs *A new direction in cutting edge technology.*

Common Features: Mini-Tower or Desktop Tool-Less Chassis • 24X max CD-ROM • 3.5" Floppy Drive • MS Windows® 95 • MS Office 97 SBE • 2 USB Ports • Microphone • Palmrest Keyboard and MS IntelliMouse® • 3-Year Limited Warranty with 1-Year On-Site Service

Direction SPL266

- 266MHz Pentium® II processor with MMX™ technology/512KB Integrated L2 Cache
- 7.0GB Hard Drive/64MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec® ACS-45 Speakers/Wavetable Audio
- U.S. Robotics 56Kbps* Data/Fax/Voice Modem
- Iomega® Zip Drive
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to Altec ACS-410 Speakers with ACS-251 Subwoofer, add \$69
- * Upgrade to NEC MultiSync® A700™ 17" Monitor (15.6" v.i.s.), add \$229

\$3299

Business Lease: \$119/mo.

Direction SPL233

- 233MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 4.3GB Hard Drive/32MB SDRAM
- 4MB SGRAM Graphic Card
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to 7.0GB Hard Drive, add \$109
- * Upgrade to Number Nine Revolution 3D, 4MB WRAM, add \$219

\$2399

Business Lease: \$86/mo.

Direction SPL266

- 266MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 7.0GB Hard Drive/64MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-90 Speakers/Wavetable Audio
- Iomega Zip Drive
- NEC 15" Monitor (14" v.i.s.)
- * Upgrade to NEC 17" Monitor (16" v.i.s.), add \$199
- * Upgrade Video Memory to 8MB WRAM, add \$109

\$2999

Business Lease: \$108/mo

Direction SPL266

- 266MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 4.3GB Hard Drive/32MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to Wavetable Audio, add \$49
- * Upgrade to U.S. Robotics 56Kbps* Data/Fax/Voice Modem, add \$119

\$2699

Business Lease: \$97/mo

NEC Express5800™ Series Servers *Servers that grow with your business.*

Common Features: Integrated PCI Wide Ultra SCSI Disk Controller • Integrated PCI SCSI Controller for Media Bays • Integrated SVGA Controller • 1MB VRAM (upgradeable to 2MB) • 12X CD-ROM • 3.5" Floppy Drive • 10/100 PCI Network Adapter • Mouse and Keyboard • NEC ESM™ Pro Server Management Software • MS Windows NT Server 4.0 and NetWare® 4.11 Certified • 3-Year On-site Service Warranty

Express5800 MT2000

- Dual Capable Pentium Pro System w/one 200MHz Pentium Pro processor/256KB Integrated L2 Cache
- 64MB ECC Memory (1GB Maximum)
- 8 Expansion Slots, 4 PCI, 3 EISA, 1 Shared
- 11 Available Bays, 6 Hot-swappable, 3 x 5.25" & 2 x 3.5" External
- One Hot-swap 4GB Wide Ultra SCSI Disk, 7200RPM
- * Optional Hot-swappable Redundant Power Supplies, add \$599
- * Optional Second 200MHz/256KB Pentium Pro processor, add \$799
- * Additional 64MB of ECC Memory, add \$449
- * PCI Wide Ultra SCSI RAID Controller, add \$1349
- * 2/4/9GB Wide Ultra SCSI Disk Drives for up to 54GB of Storage Space, add \$599/\$899/\$1499

\$5699

Business Lease: \$199/mo.

Express5800 LE2000

- Dual Capable Pentium Pro System w/one 200MHz Pentium Pro processor/256KB Integrated L2 Cache
- 32MB ECC Memory (1GB Maximum)
- 8 Expansion Slots, 4 PCI, 3 ISA, 1 Shared
- 7 Drive Bays, 3 External 5.25", 4 Internal 3.5"
- One 4GB Wide Ultra SCSI Disk, 7200RPM
- * Optional Second 200MHz/256KB Pentium Pro processor, add \$799
- * Additional 32MB of ECC memory, add \$189
- * PCI Wide Ultra SCSI RAID Controller, add \$1349
- * 2/4GB Wide Ultra SCSI Disk Drives for up to 36GB of Storage Space, add \$529/\$849

\$3499

Business Lease: \$126/mo.



To order, get a free catalog or
find your nearest reseller call
Mon-Fri 9am-5pm EST

1-888-8-NEC-NOW
Dept.No. PM528A www.necnow.com

Circle 117 on Reader Service Card

NEC

HOME PCs

Small Budget? No Problem

The price of the value-line home PC continues to drop. After Acer America Corp. and AST Computer introduced sub-\$1,000 PCs in the summer of 1996, Compaq Corp. and Packard Bell NEC followed suit with similar offerings in the past seven months. Whereas the Acer and AST machines were built on 486 processors, the latter pair of players brought low-end-Pentium performance to the sub-\$1,000 genre: the Compaq Presario 2100 used Cyrix's 133-MHz MediaGX processor (First Looks, April 22, 1997) and the Packard Bell C115 used the Pentium/120 (Trends/PCs, March 25, 1997).

This past summer, prices dropped even more for higher clock speeds. Compaq is now selling 180-MHz Media GX systems and 200-MHz Pentium PCs for under \$1,000 apiece, including monitors, while Gateway 2000 and Packard Bell are lowering the prices of 166- and 233-MHz Pentium machines, respectively. Last year, most of the prices were for system units only; now \$1,000 buys you both a PC as well as a monitor.

Designed for the sub-\$1,000 PC market, the MediaGX processor (Pipeline, April 22, 1997) integrates a graphics accelerator, audio subsystem, PCI interface, and media controller into a single low-cost product. After debuting at 133 MHz early in the year, the chip is now available in 150-, 166- and 180-MHz versions. The first machine to use the 180-MHz MediaGX is the **Presario 2200 Series** from Compaq (800-345-1518, www.compaq.com), a system that sells for \$800 (street) sans monitor. This price includes 16MB of

memory, a 1.6GB hard disk, an 8X CD-ROM drive, and a 33.6-Kbps modem (upgradeable to 56 Kbps). Even with a 14-inch Presario V410 color monitor included, the 2200 still sells for only \$1,000.

In addition to this desktop machine, Compaq is selling a special "microtower" design at prices ranging

VALUE-CONSCIOUS PCs: New systems from Gateway 2000 (above) and Compaq (below).

from \$1,000 to \$1,900 (street). All but the low-end model of the **Presario 4500 Series** ships standard with 256K of secondary cache, MPEG2 video, JBL 3D VirtualTheater, and Dolby Digital Surround. Core components vary: processors range from 200-MHz classic Pentiums to 233-MHz MMX Pentiums, CD-ROM drives from 16X to 24X, 33.6-Kbps to 56-Kbps fax modems, SyncDRAM memory from 16MB to 32MB, and hard disks from 2.1GB to

3.2GB. As with the 2200, monitors are sold separately.

Packard Bell NEC (800-733-5858, www.packardbell.com) is offering its own affordable 233-MHz MMX Pentium. At \$2,300 (street), the **Platinum 2250X** contains 32MB of RAM, a 6.4GB

hard disk, 256K of secondary cache, a 16X CD-ROM, and a 56-Kbps modem. The machine also offers two USB ports and 16-bit SRS 3-D Amphitheater Stereo Sound.

In the direct market, Gateway (800-846-2000, www.gateway.com) recently announced the **G5-166-SE**, a 166-MHz classic Pentium PC whose \$1,499 price tag includes a 15-inch monitor and a Canon Bubble Jet color printer. This machine typically ships with 16MB of SDRAM, a 1.2GB hard disk, 512K of secondary cache, a 12X/16X CD-ROM, a 56-Kbps modem, and two Altec Lansing ACS41 Speakers.—Cade Metz



ACCESSORIES

In-Flight Plug-In Power Adapter

Business travelers, take heart: Xtend Micro Products (800-232-9836, www.xmpi.com), a third-party accessory provider, is now shipping the first power in-flight adapter. Resembling your current AC adapter, the FAA- and FCC-complaint **PowerXtender Airplane and Auto Adapter** (\$100 street price) lets you plug into the plane as an auxiliary source of power. The PowerXtender also lets you recharge your battery when you're not working.

You won't see them on domestic flights yet, but Delta Air Lines, United Airlines, and Canadian Airlines are currently adapting their international and long-haul planes (mostly Boeing 767 jets) with EmPower in-seat power systems that support the PowerXtender adapter. American Airlines is also considering the seat upgrade.

The device can be plugged into your car, RV, or boat. The unique plug is actually two pieces: One is a traditional cigarette adapter and the other is the new plane connector. A standard input cable runs into a

powerbrick-like box that is actually a voltage regulator. It takes the 15 volts from the airplane and converts it into the specific voltage your notebook requires, which can range from 6 to 30 volts (there is no standard for the power systems in notebooks). Another cable connects to the notebook.

Variations in voltage between notebook manufacturers—and even between models produced by the same manufacturer—necessitate a number of different power adapters to cover the market. Xtend sells 200 different versions of the PowerXtender that are compatible with older and newer models from 15 top notebook manufacturers, including Toshiba, Compaq, Dell, IBM, Gateway, Apple, and Micron.

The PowerXtender can be purchased at major retail computer stores. Xtend Micro Products may also offer the adapter through some frequent flier programs.—Mary E. Behr



DECISION-MAKING SOFTWARE

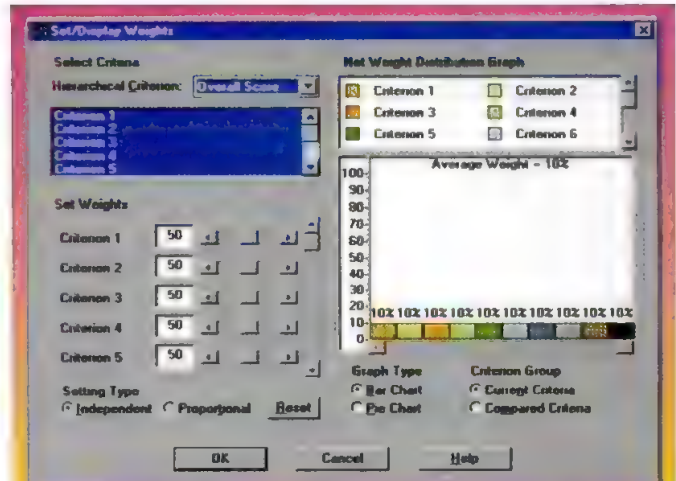
Weighing Pros and Cons

Each day, we're faced with the prospect of making many different decisions. Fortunately, software vendors have developed tools that can help weigh the pros and cons of potential choices. The most recent products take the decision-making process a few steps further.

Decision Grid 3.1, from Softkit Technologies (888-763-8548, www.softkit.com), helps you evaluate project proposals, identify the best deals for home or office purchases, select the best contractor, promote employees, and more. Priced at \$150 per user (street price), Decision Grid takes a three-step approach to decision-making: You identify the options that you want to compare, describe the criteria you deem important, and rate the alternatives against the criteria. Decision Grid then ranks your selections, organizing criteria into hierarchies that reflect their importance.

The program also allows you to accommodate ambiguities that may come into play when making a decision. You can incorporate the preferences of other decision makers and analyze their perspectives against your own. You can even generate multiple "what-if" scenarios. In addition, your Decision Grid comparison table can be directly inserted into any OLE 2.0 document container.

Decisioneering (800-289-2250, www.decisioneering.com) recently released Version 1.1 of **Analytica** (\$795 street). Described as advanced decision-modeling software, Analytica is geared toward those who work in management consulting, the health and environmental sciences, the aerospace industry, construction, and financial services. Unlike most other decision-making tools, Analytica uses "hierarchical influence diagrams" that resemble flowcharts



PERSONAL ASSISTANT: Configure your criteria in Softkit's Decision Grid.

rather than spreadsheets.

With its Intelligent Arrays feature, Analytica highlights the dimensions of a problem (including time frames, geographic regions, products, departments, and alternative plans) to determine the best possible decision in a given situation. The program takes this approach in order to prevent errors, simplify development, and add or change dimensions. Analytica also comes with risk-analysis tools

and parametric analyses that let you observe the effects of different decision scenarios.

DecideRight, Avantos Performance System's well-known product, is more similar to Decision Grid than Analytica. Although DecideRight has not yet upgraded from Version 1.2, Avantos (800-282-6867, www.avantos.com) recently added a 30-day trial version of the product to its Web site for downloading.—Yvonne Koulouthros

VOICE RECOGNITION SOFTWARE

Talking to Your PC

Voice recognition software has finally caught up with the way we speak. You no longer need to pause deliberately between words, because the newest technology—continuous voice recognition—lets you talk naturally and at a normal pace.

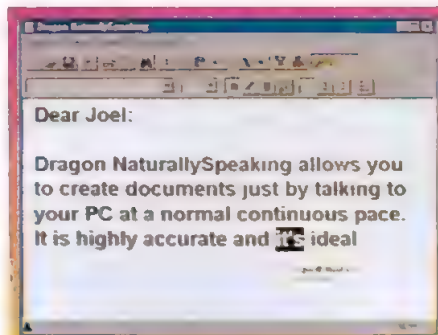
Dragon Systems (800-825-5897, 617-965-5200, www.dragonsys.com) is the first company to implement this long-awaited improvement. **Dragon NaturallySpeaking** (\$700 street) claims a 95 percent accuracy rate of words recognized and spelled correctly,

and it features a vocabulary comprising the 30,000 most commonly used words in the English language. It also comes with a customizable backup dictionary of 230,000+ words. In addition, NaturallySpeaking's select-and-say approach allows you to edit and format as easily as you dictate. Other handy features include Pronunciation Guesser and Dictation Shorthands.

Dragon plans to reduce the price of the software by the end of the summer.

IBM (800-825-5263, www.software.ibm.com/is/voicetype)

has recently released **Simply Speaking Gold** (\$100 street) and **ViaVoice** (\$200 street). Simply Speaking Gold, IBM's successor to Simply Speaking, can recognize speech containing slight pauses between words. It also enables the computer to read



A GOOD LISTENER: Dragon NaturallySpeaking.

back the text you've input. IBM claims its product has a 97% accuracy rate (on average) and a dictation speed of 70 to 100 words per minute. Simply

Speaking Gold comes with a 24,000-word vocabulary (expandable to 64,000 words). You also have the ability to make corrections by simply saying them rather than typing them.

ViaVoice takes Simply Speaking Gold one step further by including the new continuous voice recognition technology. You can speak to the computer in a normal voice as if you were talking to a person. An improved version, ViaVoice Gold, is planned for release by the end of the year.

Kurzweil Applied Intelligence Inc. (617-893-5151, www.kurzweil.com), the other major player in the voice recognition software market, was recently acquired by Lernout & Hauspie, an international firm specializing in speech and language technology. Plans are in the works to release a continuous voice recognition product by the end of this year.—Yvonne Koulouthros

RECAP PC Magazine took a look at voice recognition software in the March 25, 1997, 15th Anniversary issue, "The PC of the Future".

Trends Peripherals

GRAPHICS ACCELERATORS

It's a 3-D World After All

No longer just for gamers, 3-D graphics cards are now being marketed for the mainstream office PC as well. Offerings from ATI Technologies (905-882-2600, www.atitech.com) target gamers and business presenters, while Number Nine Visual Technologies (800-438-6463, www.nine.com) aims its high-end board squarely at professional graphic artists.

ATI's **Xpert@Work** and **Xpert@Play** both feature the DVD-capable 3-D Rage Pro chip set with 4K of on-chip texture cache for speedier 3-D performance. They also feature a 1,600-by-1,200 maximum resolution with 16.7 million colors (for the 8MB versions). The business-oriented

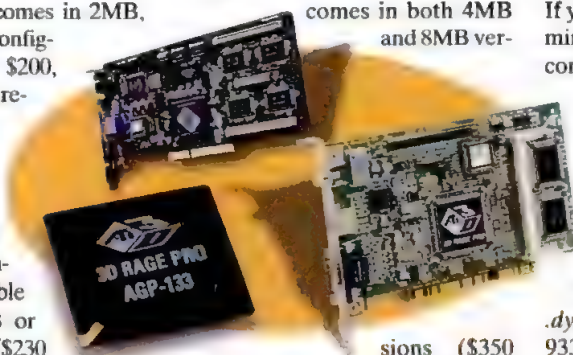
Xpert@Work comes in 2MB, 4MB, or 8MB configurations (\$170, \$200, and \$270 street, respectively).

The **Xpert@Play** is targeted at game players as well as office presenters. It is available in either 4MB or 8MB versions (\$230 and \$300 street, respectively) and offers the same features as the **Xpert@Work**.

Based on the new Ticket To Ride (T2R) chip set, Number Nine's **Revolution 3D**, which is aimed at 3-D graphic artists, uses

WRAM, and the 8MB version claims a maximum resolution of 1,280-by-1,024 with 16.7 million colors and 1,920-by-1,080 with 65,000 colors. The board

comes in both 4MB and 8MB ver-



sions (\$350 and \$450 street, respectively, expandable up to 16MB). The card has 8K of on-chip texture caching and a built-in 650-MFLOPS floating point setup engine for faster rendering. —Michael N. Rusignuolo

DVD-ROM DRIVES

I Want My DVD

If you simply can't wait another minute for DVD, you'll want to consider three new DVD-ROM upgrade kits priced way below the \$1,000 drives that debuted last winter. These kits, which are being offered by Diamond (800-468-5846, www.diamondmm.com), DynaTek (800-461-0052, www.dynatek.ca), and Samsung (800-933-4110, www.sosimple.com), include the drive, drivers, a PCI-based MPEG-2 decoder board with Dolby Digital (AC-3) audio, and a wide array of DVD titles.

From Samsung comes the **SDR-130** (\$400 to \$600 street price). Representing the second generation of DVD drives, the SDR-130 offers a fast 220-ms access time. More notable, though, is the fact that this generation of DVD drives now supports the playback of CD-R media in addition to the standard CD, CD-ROM, CD-RW, and DVD formats.

If you'd rather jump straight to a CD-RW drive with both write and rewrite capabilities for back-up and archiving, offerings from Philips (800-235-7373, www.pps.philips.com) and Yamaha Systems Technology (800-543-7457, www.yamahasyt.com) deserve a look. Note that CD-RW disks can be read only by CD-R and CD-RW drives as well as newer CD-ROM drives with multi-read capabilities.

Positioned as a storage solution for the SOHO market, Philips's **OMNIwriter** (\$800 street) is a SCSI drive that connects to your PC's parallel port via the included parallel-to-SCSI adapter. It reads at 6X speeds and writes and rewrites at 2X speed. The software bundle includes, among others, Seagate Backup Exec for CD-RW as well as Adaptec's Direct CD.

Due on the shelves this month is Yamaha's **CRW4001** (\$800 street for the internal, \$900 street for the external). It features an ATAPI interface, reads at 6X speed, and writes CD-R media at 4X speed and CD-RW media at 2X speed. Bundled with the drive are Easy-CD Pro and Direct CD. —Toni F. Kistner



DynaTek's new **DVD471TII** kit (\$580 street price; pictured above) features a DVD drive with a 200-ms access time. The kit includes audio pass-through for playing CD/DVD audio through a pre-existing sound card.

Meanwhile, Diamond's **Maximum DVD Kit** (\$600 street price) features Toshiba's DVD-ROM drive, which also has a 200-ms access time. The adapter card features TV-out support for both composite video and S-VHS. It also has a VGA pass-through design, which offers compatibility with your system's pre-existing graphics accelerator. —TFK

CD-R AND CD-RW DRIVES

Beyond the CD-ROM

Compact disk-recordable technology is finally hitting its stride. New ATAPI drives from Olympus (516-844-5000, www.olympus.com), Sony (800-352-7669, www.sony.com/storagebysony), and Micro Design International (MDI) (800-228-0891, www.mdi.com) are faster and cheaper.

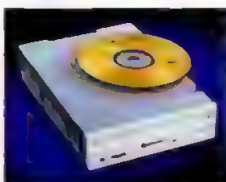
Olympus touts one of the least expensive CD-R drives on the market. The **CD-R2X6** (\$500 street internal, \$650 street external) reads at 6X speed and writes at 2X speed (a required SCSI card is not included). Both of the models include Adaptec's Easy-CD Pro 2.0 mastering software for recording audio, data, and multiformat CDs.

With 8X-read/2X-write speed and an ATAPI interface, Sony's latest **Spressa CD-R** drive (\$550 street for all bundles) presents both the fastest read

speed available and a hassle-free ATAPI system integration. Three versions are available. Both the CDU-928E/K and CDU-928E/C are targeted for professionals and bundle Adaptec's Easy-CD Pro 2.1 software for creating multimedia CDs. The CDU-928E/H is designed for SOHO users who want to archive and back up files.

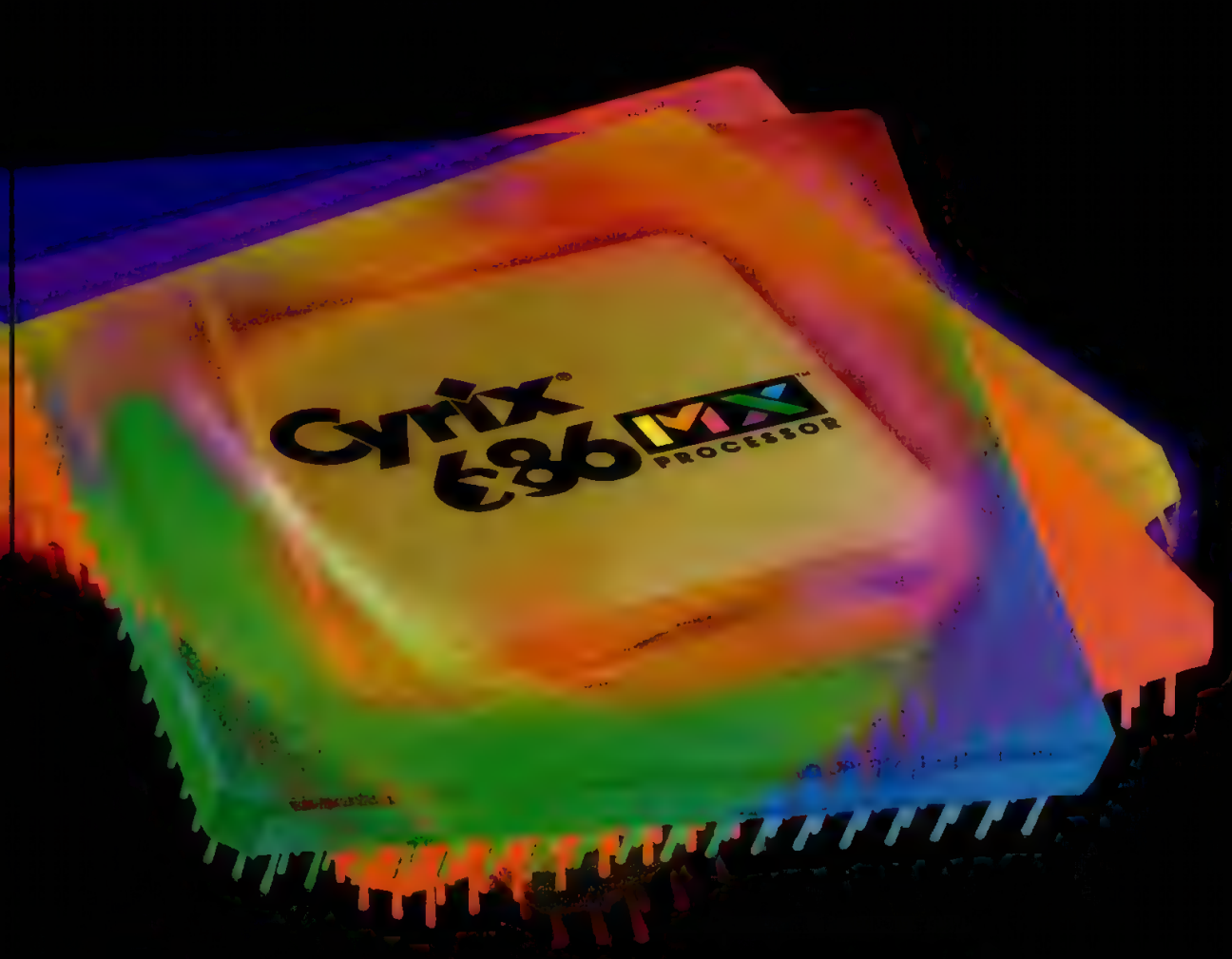


THE NEXT LEVEL: The CD-R2X6 (above) and the Spressa CD-R.



It bundles Adaptec's DirectCD packet recording software, which lets you copy files in multiple sessions by dragging and dropping them onto the lettered CD-R drive in Explorer.

If you burn several CDs a week, consider a drive with faster write speeds, such as MDI's **CD-R Express** (\$895 to \$995 street, without SCSI adapter). This robust 4X-write/6X-read SCSI II drive lets you select either 4X, 2X, or 1X recording speeds.



www.cyrilx.com

Winstone® 97 for Windows® 95

Cyrix 6x86MX™ PR233 processor	52.3
Pentium II processor 233 MHz	51.8
Pentium processor w/ MMX tech. 233 MHz	47.0 *
Cyrix 6x86MX™ PR200 processor	49.7
Pentium processor w/ MMX tech. 200 MHz	45.3
Cyrix 6x86MX™ PR166 processor	47.6
Pentium processor w/ MMX tech. 166 MHz	43.1

Get a PC with a Cyrix 6x86MX processor today:

CyberMax	800-419-4066
DirectWave	800-882-8108
Enpower	800-997-2258
Racer Computer	800-308-8767
TC Computers	800-723-8282
USA Flex	800-872-3539
Zenon	800-899-6119



extreme processSing

EXTREME
value

runs AMX[™] software • the latest feature-rich applications

extreme speed • PR166, PR200 and PR233

richer images • delivers brilliant colors and 3-D graphics

64-KByte internal cache • to boost processing performance

software compatibility • runs Windows 95 and NT – and all your software

proven Cyrix technology • for compatibility, quality and value

extreme
processing
for the
multimedia

rush[™]

Cyrix[®]
686
PROCESSOR

NEWSGROUP UTILITIES

Just the Pix, Please

Tired of wading through text messages in newsgroups that are supposedly just for posting encoded binary files? These three clients not only automate the process of finding binary image files but also help you download and decode them.

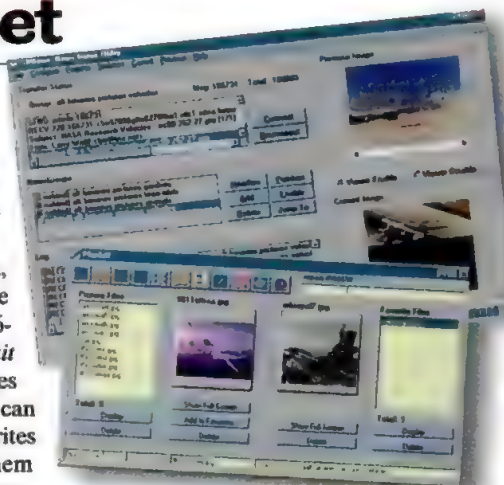
If waiting gets you down, try **News Rover**, from S&H Computer Systems (615-327-3670, www.newsrover.com). This \$29.95 shareware product for Microsoft Windows 95 and NT can download newsgroup binaries at times you determine, and it can handle both MIME and unencoding.

News Rover can watch more than one set of newsgroups and create a thumbnail gallery of images. You can filter out spam and target your downloads with specific search terms. News Rover also includes full e-mail capabilities and text-message reading.

Arizona-based programmer Scott M. Baker offers 16- and 32-bit versions of **News Robot**, a \$15 shareware utility that displays images as it downloads them (smbaker.simplenet.comsbnews/sbnews.html). Other features include an image-catalog generator, slide-show viewing, and du-

plicate detection. You can also read text messages and block messages that come from annoying posters.

Like **News Robot**, **Pluckit!** from The NetWork (817-246-3366, www.pluckit.com), displays images as they arrive. You can move files to a Favorites area and view them with a zoom feature. **Pluckit!** lacks text-reading and search capabilities, but you can exclude messages containing particular terms. You can also block messages coming from specified e-mail addresses. Al-



BINARY NEWSGROUPS: *News Robot (top) and Pluckit! help with downloading images.*

though the free trial version does not display GIFs, the \$24.95 **Pluckit!**

16 and \$29.95 **Pluckit!** 32 permit unlimited GIF access.—*Michael W. Muchmore*

WEB COMMUNITIES

Living on the Net

Thanks to increases in bandwidth, improvements in delivery technology, and the refinement of the delivery process, the Internet is giving rise to one-stop Web sites that are each striving to become your online home. Three companies in particular are attempting to create unique experiences that not only integrate community and e-commerce but also take advantage of the Internet as a means of serving up applications.

Community Network Systems (914-426-0400, www.vcot.com) invites you to join **V.C.O.T.**, or Virtual Community of Tomorrow, a media-rich "theme park" that delivers premium content over the Internet at thin-client prices. The site, which launched a preview release in June, offers "pavilions" of name-brand content, such as the Funk & Wagnalls' Knowledge Center, the Reuters News Center, and the Johns Hopkins Medical Center. It also features such services as an arcade, a modified version of PrintShop, and an avatar-

creation utility. Each pavilion also has an associated gift shop and chat forum. By the time you read this, the site should be live for e-commerce.



INTERNET LIFE: *The Globe (left) and PlanetDirect both offer personal sites to subscribers.*

V.C.O.T. requires several plug-ins for optimal performance, such as Macromedia's Shockwave Director and the iChat plug-in (a CD-ROM featuring these files is available from the company). A one-year subscription costs \$29.95.

You can also live online at

PlanetDirect, a free, personal Internet service from CMG Information Services (508-657-7000, www.planetdirect.com). You customize PlanetDirect's offerings (which include news and weather, yellow pages, stock quotes, and chat rooms) according to your location and personal interests. CMG has partnered with such notable companies as Billboard Online, MovieLink, and The Weather Channel for its content. PlanetDirect is marketed to ISPs as a co-branded front end, and it provides custom sites for over 400 cities.

The Globe, an interactive community built by WebGenesis (212-367-8589, www.theglobe.com), of-

fers entertainment, daily news, cultural forums, personal ads, interactive games, and chat rooms. You can create your own Web page with WebGenesis's Home-Builder application, and there are even plans for providing e-mail service as well. No plug-ins are necessary to use this site, which costs \$25 for a one-year subscription.—*Brett Krasnowe*

UTILITIES

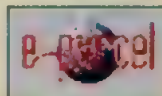
Priority Packaging

Having your PC freeze up when downloading a large file off the Web is more than annoying—it also hurts productivity. **SmartLoad**, a new product from Mitsubishi-owned e-parcel (888-377-9876, www.e-parcel.com), can solve this and other file-transfer problems that have plagued the Internet since the advent of FTP.

This client/server software package maximizes the bandwidth available on your Internet connection and senses your CPU activity. It then provides an invisible download that won't interfere with other activi-

ties. If the download is interrupted, **SmartLoad** notes where it left off and later resumes from that point. During peak hours, it compensates for access problems by taking note of file requests and completing the downloading later.

The **SmartLoad** protocol works with virtually any format, including antivirus, e-commerce, encrypted, and compressed documents. The server software runs from \$299 for five simultaneous connections to \$15,000 for unlimited connections. The client software is free.—*Josh Levy*





FEEL THE POWER

Intel Pentium® 200MHz Processor with MMX™ Technology, 48MB EDO RAM, 16x CD-ROM, 3.1 GB Hard Drive, and a 13.3" Display

TRAVEL PRO 2030CX

The Feature-Rich Affordable Notebook Computer

- 13.3" Display** XGA Resolution w/1024x768 @ 65,000 Colors
- MMX™ Technology** 200MHz Intel Pentium® Processor w/MMX Technology
- 2MB Video RAM** Outstanding Graphic Performance
- Wave Table Synthesis** "Real Instrument" Audio Performance
- 16X CD ROM** Smart Bay for Dual Battery, CD or Floppy
- Video Capture** Display TV and Live Video on Your Notebook
- 3.1GB HDD** For Expanded Storage
- Zoom Video Support** On PC Card Type III Slot
- 48MB RAM** EDO RAM Expandable to 80MB
- Lithium Ion Battery** With Dual Battery Support
- Internal Modem** 33.6 Internal FAX/Modem
- Fast FIR Interface** Fast Wireless Connection
- Lightweight** Only 6.3 lbs.

Brace yourself, we've taken our award winning TravelPro 2000 series notebook to a whole new level of performance with the 200MHz Intel MMX™ Processor, the fastest Pentium MMX™ processor available. We've upgraded the fast EDO RAM to 48MB, the CD-ROM to 16x, and the hard drive to 3.1GB for an unbelievable speed enhancement. Combine this with our new 13.3" Active Matrix Display, 2MB of high speed video RAM, a built in 33.6 modem, wave table audio and video capture system that delivers live video or television right on the notebook display and prepare yourself for light speed graphics and incredible visuals. Couple this speed demon with an estimated street price of only \$4,995.00 and you'll see why the TravelPro 2030CX will blow you away.



NOW SHIPPING

The 13.3" TravelPro 2030CX w/MMX™ Technology

\$4,995*

TravelPro Price & Feature Selector

Best Value				Best Performance			
Model	Screen	RAM	Hard Drive	Model	Screen	RAM	Hard Drive
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB
2030CX	13.3"	48MB	3.1GB	2030CX	13.3"	48MB	3.1GB

**Call For
A Dealer
Nearest You
Or Visit Our
Website**

AMS Tech
Computers & Peripherals

Putting the Future in Your Hands

800-868-8108

www.amstech.com

12881 Ramona Blvd. • Irwindale, CA 91706
626-814-8851 Fax 626-814-0782



800-440-8842
www.mcworks.com



Available USA Pricing
800-999-GTSI



HARTFORD
COMPUTER GROUP
800-434-2875
www.awa.com/hartford



Domestic & Int'l. Sales
888-DMI-COMP



800-8-DIRECT
pin#: GOAMS



800-808-3375
www.necx.com



800-252-0266
www.pcmall.com



800-555-6255
www.pcmall.com

Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corporation. All other trademarks and registered trade names are the property of their respective companies. AMS Tech is not responsible for errors in advertising. Prices and specifications are subject to change without notice or cause. *Intel Pentium® processor with MMX™ Technology

*Estimated Street Price - Dealer Pricing may Vary
CIRCLE 235 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink



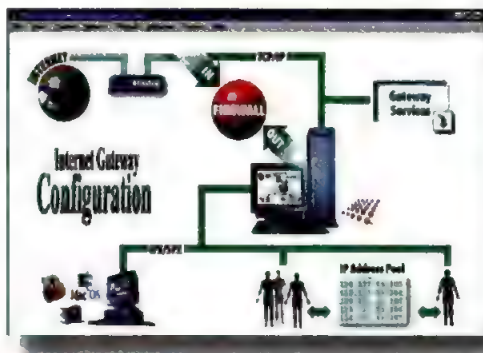
INTERNET GATEWAYS

Getting the Gate

Connecting your NetWare 3.x network to the Internet has never been an easy task. Network administrators have the choice of either installing an IP stack on every client PC—an expensive and time-consuming task for large networks—or investing in an IPX-to-IP gateway that would simply translate between the two protocols. The latest gateway releases from Berkeley Software Design (800-871-2734, www.bsdi.com) and FTP Software (800-282-4387, www.ftp.software) go beyond the simple protocol translation of earlier gateways to provide administrators with the ability

to control users' access to the Internet or their corporate intranet.

BSDI GroupGate, from BSDI (starting at \$545 for a five-user license), is a hybrid between the standard IPX-to-IP gateway and a Web-caching proxy server. GroupGate sits on a server running BSDI's 32-bit BSD/OS, which doesn't require you to add or modify any NLMs on the IPX network. Aside from doing protocol translation, GroupGate



LOCK UP THE GATE: Internet Gateway for NetWare 2.0 lets administrators lock out unwanted Web sites.

also caches often-requested Web pages. On the client side, GroupGates' 16-bit and 32-bit Internet-compliant WinSock DLL lets users enjoy various Internet applications, such as Web browsers.

Unlike GroupGate, FTP Software's **Internet Gateway for NetWare 2.0** (starting at \$500 list

price for a five-user license) does not require a dedicated server. It sits on your NetWare server and provides Internet connectivity for your LAN. And by using NetWare's user and group names, you can restrict user access to specific IP hosts, IP port numbers, Internet domains, and newsgroups. Internet Gateway also includes circuit, domain, and applications filters to allow network administrators to control a user's or a group's ability to download various Web-page contents. —Robert Daly

RECAP PC Magazine reviewed IPX-to-IP Gateways in our issue of November 19, 1996. We awarded an Editors' Choice to Performance Technology's Instant Internet.

REMOTE ACCESS

Long-Distance Allies

Today's remote-access model requires corporations to make huge expenditures for hardware, internal management, and long-distance charges. But now iPass (415-237-7300, www.ipass.com) is offering software and services that lift that burden of connectivity off your company's shoulders and place it squarely on the world's existing network of local ISPs.

The **iPass Alliance** is made up of local Internet providers in over 150 countries around the world. Signing up for **iPass Corporate Access** allows you to dial into a local ISP in any one of 750 cities worldwide. The local ISP then routes your connection via TCP/IP to the nearest iPass transaction server, which authenticates the provider as a member of the iPass Alliance and completes the connection to its destination—your corporate office. iPass's software is compatible with today's firewall and Virtual Private Network packages, so you can ensure a safe connection once you're dialed into your corporate office.

iPass Corporate Access hooks you into this extensive international network for a much lower cost than you'd incur hiring an IS manager and installing a batch of modems: The

Basic Connect plan gives you 200 user licenses and 75 start-up hours for \$1,995. At the other end of the scale is the Premium Connect plan, which gives you an unlimited number of users and 300 hours of access for \$9,995.

Additional hourly charges can range from \$0.05 to \$0.20, depending on the location the remote user is dialing from, and there is a \$2.00 monthly billing charge per individual user. In addition to being much less expensive than long-distance calls or maintaining a toll-free number for local access, calls to local providers also increase your chances of achieving higher connection speeds. This helps keep the length (and cost) of calls down. —David R. Lambert

TRUE GLOBAL
Internet Roaming



Local call credits from ANYWHERE in the world!

©1996 iPass Corporation. All Rights Reserved.

MAPPING TOOLS

Topology 101

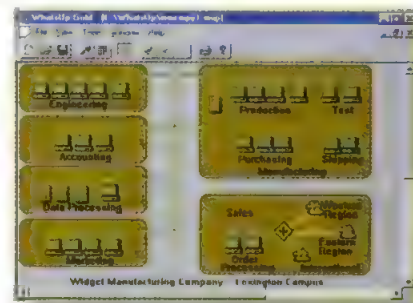
Networks are dynamic entities. Keeping track of who and what is on your network—and finding trouble spots—can be a full-time job. Making that job easier are two new network discovery and mapping tools.

PinPoint Software (408-997-6900, www.pinpoint.com) offers a software-only automated network mapping package. **ClickNet ADS4000** (\$5 to \$7 per node with a 50-node minimum) includes over 2,500 network equipment images to provide colorful and accurate maps of your network. ClickNet can map your entire network, store all of the information in an ODBC-compliant database, and generate 85 built-in reports. The program's strength lies

in its drag-and-drop diagramming interface, which enables you to group like objects together as well as drill down and create multilevel diagrams. The Topology Wizard walks you through the process of adding new segments to the network, from choosing a layout to as-

signing the appropriate symbol to each node you've added.

Ipswitch (617-676-5700, www.ipswitch.com) offers **WhatsUp Gold**, the \$595 enterprise version of its WhatsUp monitoring and mapping software. Available for Microsoft Windows 95 or NT as well as the DEC Alpha platform, WhatsUp Gold is scalable and can create maps for subnets across large networks, linking those maps together to provide simultaneous monitoring. WhatsUp Gold includes a map layout editor with a



THE BIG PICTURE: WhatsUp Gold.

full array of shapes and tools.

The software also monitors your existing network, polling all of the TCP/IP-connected nodes for their availability and sending alerts via e-mail, pager, or desktop alarm when a problem is detected. —David R. Lambert

They sent the wrong eval units. You were told you'd
have that software yesterday...and you thought you
were drinking decaf!

**At least you don't need to worry
about memory.**

In your world, there's no such thing
as a smooth day.

That's why VisionTek makes memory
for corporate IS. Which means we do
more than manufacture outstanding
components. We back them up with
superior tech support and value-
added customer services designed for
IS professionals. Like free evaluation
assistance which lets you
test memory on your terms.

Or working with you to extend
the productivity of your technology
investments. Or total access to the
VisionTek team when you need it—
whether it's via fax, online or through
our toll-free hotline.

All of which makes specing your
company's memory faster and easier.
So you don't have to devote a lot of
time and effort to it yourself. When
you spec VisionTek, you get the atten-
tion, service, support and flexibility
that a slow-moving, giant vendor sim-
ply won't touch. No beans about it.

*Call your authorized reseller or
1-800-826-9855 today.*

more than memory



<http://www.visiontek.com> © 1997 VisionTek



VisionTek, Inc.
Registered to ISO 9001
Certified NO. A5241



CIRCLE 065 ON READER SERVICE CARD

GROWTH HAPPENS. MANAGE IT.



DELL POWEREDGE 2200 SERVER 233MHz PENTIUM® II PROCESSOR (Dual Processor Capable, RAID Capable)*

- 64MB ECC EDO Memory (512MB Max)
- 512KB Integrated L2 Cache
- Integrated PCI Ultra-Wide SCSI-3 Controller
- 4GB Ultra-Wide SCSI-3 Hard Drive (27GB Max)
- 8X SCSI CD-ROM Drive
- Intel® Pro/100B PCI Ethernet Adapter
- ★ **MS® Windows NT® Server 4.0 (10 Client Access Licenses)**
- Intel® LANDesk™ Server Manager v2.5x
- Dell Server Assistant CD-ROM
- 6 Expansion Slots: 3 PCI, 3 EISA
- 6 Drive Bays: 3 Hard Drive, 3 Removable Media
- ★ **3 Years Next Business Day On-site* Service**
- 7x24 Dedicated Server Hardware Technical Telephone Support
- ★ **Upgrade to a 266MHz Pentium II Processor, add \$300.**
- ★ **Upgrade to 128MB ECC EDO Memory, add \$460.**

\$4599

Business Lease†: \$159/Mo.
Order Code #250084

THE NEW DELL POWEREDGE 2200 SERVER. EXPANDABILITY FOR YOUR GROWING BUSINESS.

Just because growth is unpredictable doesn't mean it has to be unmanageable. Especially since the *NEW* Dell PowerEdge 2200, the feature-optimized server with the perfect mix of performance and expandability, can be yours for one of the best prices in the industry.



Advanced technology like Pentium II® processors, dual processing capability, and an optional RAID feature deliver outstanding performance. Call Dell today and we'll start building a PowerEdge Server for your growing business immediately. Since it's never too early to get a jump on the competition.

DELL®

TO ORDER TOLL-FREE

800-660-8670

TO ORDER ONLINE

www.dell.com/buydell

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT
Sun 12pm-5pm CT In Canada, call 800-233-0702
GSA Contract #GS-35F-4076D

Keycode #04523

*Full computer system. Includes: Dell PowerEdge 2200 Server, 233MHz Pentium II Processor, 64MB ECC EDO Memory, 4GB Ultra-Wide SCSI-3 Hard Drive, 8X SCSI CD-ROM Drive, Intel® Pro/100B PCI Ethernet Adapter, MS® Windows NT® Server 4.0 (10 Client Access Licenses), Intel® LANDesk™ Server Manager v2.5x, Dell Server Assistant CD-ROM, 6 Expansion Slots: 3 PCI, 3 EISA, 6 Drive Bays: 3 Hard Drive, 3 Removable Media. †Business Lease available for 3 years. ‡On-site service available for 3 years. *MS, Windows, and Windows NT are registered trademarks of Microsoft Corporation. Intel, Pentium, and Pentium II are registered trademarks of Intel Corporation. Dell is a registered trademark of Dell Computer Corporation. ©1997 Dell Computer Corporation. All rights reserved.

First Looks



In Through The Thin Door

LCD monitors embark on a goal to take over desktop space—but they're not cheap.—By Alfred Poor

LCD monitors have arrived, and they look marvelous. The high-tech styling and impossibly thin cases draw reactions ranging from envious glances to open-mouthed stares. If you see one you'll probably want one, but the bigger question is, will you buy one?

The vast majority of LCD panels find their life's work in

notebook PCs, but more and more users have become intrigued with the potential benefits of attaching LCD panels to their desktop systems. Until recently, there were major drawbacks associated with putting an LCD on your desk. Many required proprietary graphics adapters, and most failed to provide the performance and fea-

tures that users wanted.

For the most part, the current crop of displays has overcome these hurdles. First, they're all plug-in replacements for CRT monitors—just disconnect the VGA cable from the back of the tube and plug it into the panel. And second, their image quality will knock your socks off.

LESS DESK SPACE . . .

As users come to expect larger images, the advantages of LCDs over CRTs get stronger. CRTs require considerable space behind the screen to accommodate the electron guns they use (a rule of thumb is that a monitor case is as deep as the diagonal measurement of the screen).

As screen sizes grow, CRTs need larger vacuum tubes that require more glass to contain the vacuum. This makes the monitor larger, heavier, and more costly. LCDs are only inches thick (not counting their stands) and comparatively lightweight (the average device here weighs about 12 pounds, compared to about 50 pounds for a typical 17-inch CRT). The weight gain for larger panels is roughly proportional to the increase in display area.

. . . BUT A LOT MORE CASH

So what's the catch? LCD monitors are expensive. Prices have come down a lot in recent years, but they still cost many times more than equivalent CRTs. The five LCD monitors that we reviewed are priced at about \$2,400 to \$2,700 (all have 14- to 14.5-inch panels), and Compaq's new TFT500 15.1-inch-diagonal display (see the sidebar, "Compaq Brings USB to the LCD Party," page 48) costs nearly \$4,000. The average high-quality 17-inch CRT monitor, on the other hand, will set you back about \$700.

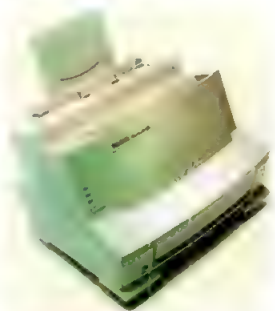
The problem is that active-matrix panels are expensive to

INSIDE



PSIONIDE FOR CEP: With a new 32-bit OS, Psion's Series 5 rivals Windows CE machines. See page 58.

NEW DEVELOPMENT: Delphi 3 takes RAD programming to the cutting edge. See page 64.



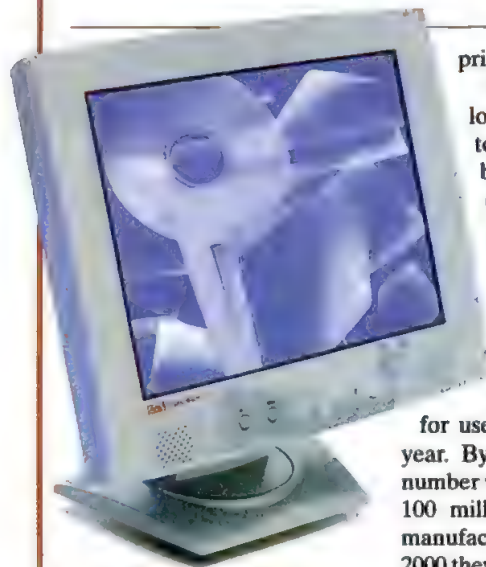
JET SETTING: HP's new 6-ppm, 600-dpi LaserJet 6L is a fast, efficient, and affordable printer. See page 68 for the full review.



PICTURE THIS: New Digital cameras from Fuji and Kodak offer exciting features for entry-level and midrange buyers. Page 62.

More Products Reviewed. . .
 SureTrak Project Manager 2.076
 Office 97 Books73

First Looks



CTX PanoView 745

Street price: \$2,600

CTX Opto Inc., Sunnyvale, CA; 888-289-6786,
408-541-6060

www.ctxopto.com

Circle 410 on reader service card.

make, especially when you get to larger sizes and higher resolutions. The panel has to complete the manufacturing process before flaws can be detected, and while production yields have improved in recent years, the process is still far from perfect.

Users are willing to pay more for an LCD's advantages, but this willingness has its limits. According to a study conducted by Stanford Resources (San Jose, CA), American buyers are reluctant to pay much more than double the price of an equivalent CRT. In fact, wide-scale adoption would come about only when LCD monitors are priced at about 1.25 times the CRT price.

The best opportunity for competitive pricing appears to be with the larger display sizes. For example, a 15-inch LCD panel offers roughly the equivalent viewable area of a 17-inch CRT. Stanford Resources estimates that the 1997 price for CRTs in this size range will average about \$731, compared to \$3,680 for a comparable LCD monitor. By 2000, the company projects that CRT pricing will drop to \$476, while LCD panel

prices will drop to \$996.

Even if LCD pricing is low enough to appeal to a large number of buyers, there is some question surrounding how quickly manufacturers could respond to increased demand. Stanford Resources predicts that about 78 million 15- to 17-inch CRTs will be sold

for use with computers this year. By the year 2000, that number will swell to more than 100 million units. But LCD manufacturers project that by 2000 they will have the capacity to produce only about six million LCD panels larger than 14 inches—enough for just a six percent share of the total display market.

For this roundup, we gathered the first five 14-inch (or larger) LCD monitors with a resolution of 1,024-by-768: the PanoView 745 from CTX Opto, the Hewlett-Packard HP 1024, the NEC MultiSync LCD400, the

Sceptre FT15, and the VP140 ViewPanel from ViewSonic. Each one is an active-matrix panel that plugs directly into a standard graphics adapter and takes up little space on your desk.

BUYING TIPS

Choosing an LCD monitor is quite different from evaluating a typical CRT. For example, a CRT can display a range of resolutions. An LCD panel has a fixed number of liquid crystal cells and can display only one resolution at full-screen size using one cell per pixel. Most can display lower-resolution images by scaling the image to fill the screen, but this works better for continuous-tone images like photographs than it does for text and images with fine detail.

A CRT has three electron guns—one each for the red, green, and blue signals—and the three electron streams must converge faultlessly in order to create a sharp image. There are no convergence problems with an LCD panel, because each cell is

switched on and off individually. This is one reason why text looks so crisp on an LCD monitor. You don't have to worry about refresh rates and flicker with an LCD panel—the LCD cells are either on or off, so an image displayed at 60-Hz refresh should not produce any more flicker than one at 75-Hz refresh.

Conversely, it's possible for one or more cells on the LCD panel to be flawed. On a 1,024-by-768 monitor, there are three cells for each pixel—one each for red, green, and blue—which amounts to nearly 2.4 million cells ($1,024 \times 768 \times 3 = 2,359,296$). There's only a slim chance that all of these will be perfect; more likely, some will be stuck on (creating a "bright" defect) or off (resulting in a "dark" defect). Some buyers figure that spending so much money on a display entitles them to perfect screens—unfortunately, this is not the case.

Different companies have different policies about how many defects an LCD monitor must have before it can be ex-

SUMMARY OF FEATURES

LCD Monitors

PC MAGAZINE
EDITOR'S CHOICE

■ YES ■ NO	CTX PanoView 745	Hewlett-Packard HP 1024	NEC MultiSync LCD400	Sceptre FT15	ViewSonic VP140 ViewPanel
Products listed in alphabetical order					
Street price	\$2,600	\$2,420	\$2,700	\$2,500	\$2,500
Panel size (diagonal, in inches)	14.5	14.0	14.1	14.5	14.0
Dimensions (HWD, in inches)	15.0 x 15.2 x 7.1	14.5 x 14.3 x 5.9	14.3 x 14.1 x 6.7	15.7 x 15.5 x 8.1	14.0 x 14.0 x 5.9
Weight with base (pounds)	12.3	11.0	11.5	12.7	12.1
Pixel resolution	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768
Maximum signal resolution	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768	1,024 x 768
Maximum refresh at 1,024 x 768	75 Hz	75 Hz	75 Hz	75 Hz	75 Hz
Lower-resolution images scaled/not scaled	■ ■	■ ■	■ ■	■ ■	■ ■
Maximum colors	16.7 million	16.7 million	16.7 million*	262,144	16.7 million
Drivers needed	■	■	■	■	■
Other software	None	HP Optimizer	None	None	VESA DPMS utility for DOS and Windows 3.x
Tilt/swivel stand	■ ■	■ ■	■ ■	■ ■	■ ■
Brightness/contrast controls	■ ■	■ ■	■ ■	■ ■	■ ■
On-screen menus	■	■	■	■	■
Minimum number of defective pixels for service or replacement	10	1 complete pixel; 15 subpixels on, or 18 subpixels off	Depends on the number and location of defects	9	7; 2 if adjacent
Warranty	1 year	1 year	Backlight, 1 year; other parts and labor, 3 years	1 year	Backlight, 1 year; other parts and labor, 3 years

* This is an analog LCD, so theoretically there is an unlimited color palette (as with a CRT).

changed for a new panel. In general, most vendors will exchange displays containing six defects or more.

LCD monitors have other elements that you don't find in CRT displays. The panels are lit by fluorescent tubes that snake through the back of the unit; sometimes, you'll see brighter lines in some parts of the screen than in others. You may also see ghosting or streaking, where a particularly light or dark image can affect adjacent portions of the screen. And fine patterns such as dithered images may create moiré or interference patterns that jitter.

To test these five LCD monitors, we used DisplayMate for Windows from Sonera Technology (908-747-6886). We selected a series of images that were specially designed for us to identify pixel flaws, bandwidth deficiencies, image uniformity, moiré patterns, and other qualitative factors.

These monitors represent what you can expect in the short term for this market segment. They are all very good, but none are perfect. These products will be joined by other similar ones this year, but don't expect CRT displays to disappear any time soon.

CTX Opto Inc.

PanoView 745

The 14.5-inch CTX PanoView 745 produces acceptable images and has some handy extra features, but there are some other aspects—such as the lack of a contrast adjustment—that detract from its appeal. Its street price of \$2,600 is near the top of this closely grouped field; nevertheless, at 14.5 inches, it is larger than three of the other units we tested.

On the plus side, the PanoView 745 comes with built-in stereo speakers that include synthetic surround-sound sup-

Editors' Choice

• NEC MultiSync LCD400



The good news about these five LCD monitors is that they all

produce acceptable images or better. The crispness of the text displayed by these panels in a typical Windows environment must be seen to be believed. You simply will not go wrong by picking any one of them. And considering the fact that each LCD monitor costs nearly four times the average 17-inch CRT, we believe that you *should* get a high-quality display.

But in this competitive group, one panel stood out from the pack: the 14.1-inch NEC

port and a mute button on the front panel. The power switch is conveniently located in the front as well. When displaying a lower-resolution image, you have your choice of either filling the screen or centering the image using one LCD cell per pixel. This feature is helpful, because the scaling process can produce artifacts that may make the image more difficult to view. The PanoView 745 was only one of two monitors in the group to offer a swivel base; this is not as important as it would be with a heavier CRT display, but it could be convenient in some settings.

Like the other monitors in this roundup, the PanoView uses the same cable as a CRT monitor. Unfortunately, there is little clearance for the plug, and the connector is difficult to reach. The on-screen menu system for configuration and adjustments took a bit more navigating than average, and the PanoView was the only monitor in the group without a contrast adjustment.

The display's images were generally good. The backlight was even, with no apparent bright spots, and colors were reproduced well. The only

weak points were some shimmering in certain fine patterns and some evidence of insufficient bandwidth (fine vertical white and black lines tended to appear gray). Also, the viewing angle was not as wide as some of the other monitors.

Our test panel had two bright pixel defects, but it lacked any dark defects. Unfortunately, CTX does not have an official policy on just what constitutes a defective display. Instead, the vendor relies on the specifications of the LCD panel manufacturer as its guideline. In this particular case, the panel is made by Sharp, whose specs state that an acceptable unit may have as many as 15 pixel defects. Other vendors have more stringent quality standards.

In terms of display quality, the PanoView is about average for the group (which is very good overall). The extra features might sway some, but the lack of a firm policy on pixel defects will probably convince other potential buyers to look elsewhere.

MultiSync LCD400. Easy setup and configuration, excellent documentation, and a rock-steady image with no pronounced flaws—all backed by a 3-year warranty—combine to make this NEC monitor the very best for your dollar. At a street price of \$2,700, the device may be the most expensive one in this roundup. But the extra \$100 to \$200 that you'll pay over the other products reviewed here is well worth it.

The MultiSync is also the only LCD monitor in this roundup that does not require an external power brick. Just plug a standard monitor cable directly into the back of the chassis, then connect it to your PC, and you're ready to go. And after they are hooked up, the unit's front-panel digital controls will take you to intuitive, easy-to-understand on-screen menus that make the monitor easy to configure without referring to the product manual.

Hewlett-Packard Co.

HP 1024

The 14-inch HP 1024 (\$2,420 street price) is priced lower than most of the monitors in this roundup and is an acceptable choice. On the downside, it's not very convenient to set up. Also, its image quality isn't quite as



Hewlett-Packard HP 1024

Street price: \$2,420

Hewlett-Packard Co., Palo Alto, CA; 800-322-4772; fax, 800-231-3300

www.hp.com

Circle 411 on reader service card.

First Looks

good as the others in this group.

The HP 1024's tilt/swivel base has two separate cable covers in the back that must be removed before you can connect a standard monitor cable to the display. Hiding the cable is certainly a tidy goal, but the covers could have been designed for easier use. You can also remove the panel from the stand entirely by taking out four screws, making it possible to mount the display on a wall. The monitor also has a mounting point for a

Kensington lock, which can help secure the device.

The power switch and rollers for brightness and contrast are favorably mounted on the front of the panel. The remaining digital controls are hidden behind a drop-down hatch.

The HP 1024's on-screen menu system is functional, but some of the controls are difficult to use effectively. Repeated adjustments to the tuning and fine-tuning settings failed to remove all pixel jitter completely, and

the interaction between brightness and contrast settings required successive changes to both when setting up the monitor for our tests. The HP 1024 is bundled with software that you can use to optimize the display settings—this is helpful if you do not have a utility such as DisplayMate.

On the plus side, our evaluation unit had no visible pixel defects. The backlight had no noticeable hot spots, and the display did well on the bandwidth

test. On the minus side, however, color gradients showed some breaks in the low-intensity range, some patterns produced noticeable horizontal streaking, and fine patterns such as the moiré tests resulted in lots of jitter and banding artifacts.

Hewlett-Packard has a complex policy regarding pixel defects. The vendor will accept returns if there are 6 adjacent bad subpixels, 15 or more subpixels "on," or 15 or more subpixels "off" in given areas.

Compaq Brings USB to the LCD Party

If a 14-inch LCD monitor just isn't big enough to satisfy your needs, Compaq Computer Corp. may have the answer with its 15.1-inch-diagonal TFT500 Flat Panel Monitor. At a street price of \$3,800, this monitor, like the others in this roundup, is not cheap. But the gorgeous images it produces, plus the added bonus of three USB connectors in its standard base, make this one attractive and functional LCD.

The TFT500's active-matrix panel supports a maximum 1,024-by-768 resolution at 75 Hz and 262,144 colors, and it provides approximately the same viewable area as a traditional 17-inch CRT monitor. An antireflective coating is applied directly to the glass to reduce glare. We did not receive our unit in time to test it for inclusion in our main roundup, but during subjective testing we found the image quality to be very high. The backlight was even with no bright spots, and there were no pixel defects. Some shimmering and slight banding was evident when displaying gray backgrounds, but images produced were otherwise good.

ON THE BASE, OFF THE WALL

The TFT500 can be set up three different ways. You can use the included stand (which brings the 12-pound panel's weight up to about 20 pounds), or you can take the panel off the stand to mount it either on a wall or on a standard arm-mount bracket. When attached to the base, the unit measures 17.2 by 15.1 by 9.1 inches (HWD).

Once you've decided how to set up the TFT500, getting it hooked up to your PC is an easy task. Just plug a standard monitor cable into the back of the unit, plug the video connector into the back of your PC, plug in the power cord (sans brick) and you're all set. The monitor requires no special graphics adapter, and the panel itself tilts to provide the best viewing angle for individual users.

Adjusting the display is facilitated

by three easy-to-use buttons located on the front of the monitor. Through these controls, you can adjust brightness, contrast, color, and horizontal and vertical position, among other settings.

A power-saving mode can be set to put the monitor into suspend or sleep modes. An Energy Star-compliant device, the TFT500 will power down to less than 20 watts. If you want to add audio to your viewing experience, the TFT500 is compatible with Compaq's Multimedia Sound System (\$80 street). This U-shaped device is about 2 inches tall and 14 inches wide, with two stereo speakers, a power switch, volume controls, and a mute button.

DID SOMEONE SAY USB?

One of the most unique features of the Compaq TFT500 is its base, which integrates a USB hub with three USB connectors. You can use these connectors to plug three major USB peripherals into the monitor and then daisy-chain up to a total of 127 USB devices. Granted, you can count the number of USB devices available on the market today with one hand. Nevertheless, once USB devices are available in quantity, you'll be ready for them.

If there's one thing that Compaq takes very seriously, it's

management, so it comes as no surprise that the TFT500 supports the company's Intelligent Manageability. Although you can get the serial number of the unit directly from the on-screen menus, you can track the TFT500's assets over the network through Compaq's AssetControl, which works when the panel is used with a Compaq PC with Intelligent Manageability. This monitor is also DDC2 compliant, so it can communicate bidirectionally with your PC.

Compaq backs the TFT500 with a 3-year parts and labor warranty, plus 1 year of on-site service (1 year for the backlight).

If you've got the cash, the Compaq TFT500 Flat Panel Monitor is a great investment.—Carol Venezia





Juiced Up.

Call now to order.
800-707-2329
www.micronpc.com



CONFIGURED FOR YOUR LIFE

Pick Micron.TM

We've got the best computers in the bunch.

At Micron, we know you want the freshest technology out there. So our engineers are continually devising new ways to make our award-winning PCs smarter, faster and more fun. Whether you use your computer for home or business, we've got a system for you. And you'll never find a lemon in the bunch. Our components go through rigorous quality-assurance testing, and all Micron products conform to the highest industry certification standards.

When you pick Micron, you can custom configure a system that fits your specifications — so it's homegrown, not mass-produced. Pick Micron and you'll get the steadfast 24-hour customer support that we're famous for. And when you pick Micron, you're getting one of the best warranties in the business from the best company in the industry.

So pick Micron today. It'll be good for you.



Available

Lots of zing.



The Micron TransPort™ Series. Notebooks with real bite.

What's small, sweet and gives you a lot of punch?

A Micron TransPort notebook, of course. Our outstanding line of portable PCs offers impressive flexibility, tempting prices and the hottest features on the market.

High-end users will love our TransPort XKE. A true desktop replacement, we've loaded our XKE with a high-performance graphics accelerator, active matrix screen, upgraded CD-ROM, tons of memory and more. Our TransPort XPE fits the bill if you're looking for a top-grade computer for home, office or travel. And our TransPort VLX offers flexibility and sleek styling for a more-than-palatable price.

So pack a little punch. Try our TransPort notebooks.

Call now to order.
800-707-2329
www.micronpc.com



CONFIGURED FOR YOUR LIFE



Like peas in a



The Micron Vetix[®] and ClientPro[®] Series. Solutions for a healthy network.

Need solutions for your growing network?

If you can dish it out, our systems can take it. Our ClientPro PCs and Vetix servers effortlessly get your network running – and keep it running.

We pack our hardy Vetix MXI chock-full of features, like redundant power supplies and high-degree, fault-tolerant components including swappable hard drives. And we made our entry-level LXI models expandable, reliable and tough.

pod.



Complement your server with our ClientPro desktops. We've designed them to be easy to set up, easy to upgrade and easy to network. That means you reduce potential downtime and lower your total cost of ownership. And if you have networking questions – your answers are just a phone call away. That's what our unwavering customer support is all about.

This powerful pair makes networking easy. And that's a pretty sweet dish.

Call now to order.

800-707-2329

www.micronpc.com



CONFIGURED FOR YOUR LIFE



Extra hot.



The Micron[™] Millennium[®] Series adds some kick.

You want power. You want performance. In other words, you want Micron.

Check out our Millennium[®] series. Even though it's packed a wallop in personal computing for a long time, we keep figuring out ways to make it better.

Now our Millennium line includes models with Fusion 3D[™] for those ready to dish up computer entertainment – real entertainment like graphics-laden games or video-packed Internet sites. Our Millennium XRU with Pentium II processors and MME with Pentium processors feature MMX[™] technology, 3D video, MPEG and 24X EIDE CD-ROM. These desktops promise speed, performance and easy upgrades.

The Micron Powerdigm[™] sets a sizzling pace.

The Powerdigm is our new workstation, turbo-powered by dual Pentium Pro processors. Believe it. This is the ultimate system for all your graphic design projects, engineering graphics, financial analyses, CAD and more!

Super-hot Powerdigm features include the capability to run multiple hard drives and two monitors at the same time. And your system is network ready, right out of the box. You also have the option of adding Diamond Fire GL video cards, giving you awesome (and affordable) 3D imaging. Call Micron today for information on the Powerdigm and our other extra-hot performing systems!

Call now to order.
800-707-2329
www.micronpc.com



CONFIGURED FOR YOUR LIFE

MICRON[®] MILLENNIA[®] Xw with FUSION 3D[™]

Intel 266MHz Pentium[®] II processor (features MMX[™] technology)
4MB EDO RAM
6.4GB EIDE hard drive
19" Hitachi SuperScan CM75L .26dp (18" display)

STANDARD FEATURES

512KB internal L2 cache, 2MB BIOS
Diamond Stealth Pro DX, 3D video, MPEG, 4MB EDO RAM
Monster 3D graphics card with 4MB memory
3.5" floppy drive, 100MB Iomega Zip drive
DVD-ROM drive, DVD software, E4 Cool DVD PCI decoder card:
6 channel AC-3 to 2 channel out capability, SPDIF output
(digital audio out)
US Robotics Sportster 56K x2 internal data/fax modem
Awe 64 PCI sound card
Cambridge SoundWorks/MicroWorks
2 speaker satellite with subwoofer stereo system
Tool-free minitower or desktop
Microsoft[®] Intellimouse, 104-key keyboard
Microsoft Windows[®] 95 and MS[®] Plus! CD
Microsoft Office 97 SBE CDs
Universal Serial Bus connections
Fusion 3D game pak:
Mech Warrior 2: Mercenaries 3Dfx version
AH-64 Longbow, U.S. Navy Fighters '97
Command & Conquer, Popular 3Dfx
Racing Sim
MS Sidewinder Pro joystick
5-yr/3-yr Micron Power[™] limited warranty

\$3,999
Bus. lease \$136/mo.

MICRON MILLENNIA MME with FUSION 3D[™]

Intel 233MHz Pentium processor with MMX
4MB SDRAM
4GB EIDE hard drive
17" Micron 700Fcx, .26dp (16.0" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
Diamond Stealth Pro DX, 3D video, MPEG, 4MB EDO RAM
Monster 3D graphics card with 4MB memory
3.5" floppy drive
100MB Iomega Zip drive
24X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound
Advent 370's - speaker/subwoofer system
US Robotics Sportster 56K x2 internal data/fax modem
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
Universal Serial Bus connections
Fusion 3D game pak:
Mech Warrior 2: Mercenaries 3Dfx version AH-64 Longbow,
U.S. Navy Fighters '97 Command & Conquer, Popular 3Dfx
Racing Sim
MS Sidewinder Pro joystick
5-year/3-year Micron Power
limited warranty

\$2,799
Bus. lease \$95/mo.

MICRON MILLENNIA X2w

Intel 266MHz Pentium II processor (features MMX)
4MB EDO RAM
6.4GB EIDE hard drive
17" Micron 700FGx, .26dp (16.0" display)

STANDARD FEATURES

512KB internal L2 cache, 2MB BIOS
3.5" floppy drive
100MB Iomega Zip drive
24X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound with speakers
US Robotics Sportster 56K x2 internal data/fax modem
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
Multimedia Excitement Pak
(comprised of MMX technology-based software)
Universal Serial Bus connections
5-year/3-year Micron Power
limited warranty

\$2,999
Bus. lease \$102/mo.

MICRON MILLENNIA MME P200

Intel 200MHz Pentium processor with MMX
48MB SDRAM
4GB Ultra ATA hard drive
17" Micron 700FGx, .26dp (16.0" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
3.5" floppy drive
100MB Iomega Zip drive
24X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound with speakers
US Robotics Sportster 56K x2 internal data/fax modem
PCI 64-bit 3D video, MPEG, 4MB EDO DRAM
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
Multimedia Excitement Pak
(comprised of MMX technology-based software)
Universal Serial Bus connections
5-year/3-year Micron Power
limited warranty

\$2,299
Bus. lease \$78/mo.

MICRON MILLENNIA LTe P166

Intel 166MHz Pentium processor with MMX
16MB EDO RAM
2.1GB EIDE hard drive
15" Micron 500FGx, .28dp (13.7" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
3.5" floppy drive
16X EIDE variable speed CD-ROM drive
16-bit stereo sound and speakers
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Tool-free minitower or desktop
Microsoft Mouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Works CD
Universal Serial Bus connections
5-year/3-year Micron Power limited warranty

\$1,499
Bus. lease \$58/mo.

MICRON POWERDIGM[™] XLI

Dual Intel 200MHz Pentium Pro processors
64MB ECC EDO RAM
4GB Ultra-Wide SCSI-3 hard drive
19" Hitachi SuperScan CM75L (18" display) .26dp color monitor
Number Nine Imagine 128 series II video card, 4MB VRAM

STANDARD FEATURES

256KB internal L2 cache, flash BIOS
3.5" floppy drive
Plextor 12/20 Plex variable speed SCSI CD-ROM drive
Memory upgradable to 512MB ECC EDO RAM
Supports multiple Ultra-Wide SCSI-3 hard drives
PCI 32-bit Ultra Wide SCSI-3 controller
Iomega Jaz SCSI drive with 1GB removable cartridge
32 voice wavetable stereo sound with speakers
3Com 3C905 Fast EtherLink XL 10/100 PCI TPO network adapter
Tool-free minitower
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows NT[®] Workstation
5-year/3 year Micron Power
limited warranty

\$4,899
Bus. lease \$167/mo.

The 24000 drive will be received upon the purchase of the 486 system.
Maximum theoretical speed of up to 10MBps when transferring data and 10MBps when
uploading streams. Actual performance is dependent upon numerous factors and
transfer rates may be less than the maximum capacity.



MICRON VETIX™ Mxi

Intel 200MHz Pentium Pro processor
128MB ECC EDO RAM
Three 4GB Ultra-Wide SCSI-3 hard drives (12GB total)

STANDARD FEATURES

256KB integrated L2 cache
Dual Pentium Pro ZIF sockets
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
Integrated Intel EtherExpress Pro 100 controller
Integrated SVGA graphics
12x variable speed SCSI CD-ROM drive
3.5" floppy drive
5 internal, hot-swappable, hard drive array bays (upgradable to 10)
3 external 5.25" media bays
1 (one) 330 watt power supply standard
(upgradable to 3 for added redundancy)
Microsoft Mouse, 104-key keyboard
Microsoft Windows NT Server 4.0 (10-user license)
Intel LANDesk™ Server Manager 2.52
Integrated hardware instrumentation
Dedicated server technical support, 7x24
5-year/3-year Micron Power limited warranty
1-year next-business-day on-site service
NOS Support (3 incident resolutions/
1st year), 7x24

\$7,999

Bus. lease \$251/mo.

MICRON VETIX™ 2Mxi

Dual Intel 200MHz Pentium™ Pro processors
256MB ECC EDO RAM
Five 4GB Ultra-Wide SCSI-3 hard drives (20GB total)

STANDARD FEATURES

512KB integrated L2 cache
Mylex dual channel Ultra-Wide SCSI-3 RAID caching controller
w/4MB ECC RAM
Dual Pentium Pro ZIF sockets
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
Integrated Intel EtherExpress™ Pro 100 controller
Integrated SVGA graphics
12x variable speed SCSI CD-ROM drive, 3.5" floppy drive
5 internal, hot-swappable hard drive array bays (upgradable to 10)
3 external 5.25" media bays
1 (one) 330 watt power supply standard
(upgradable to 3 for added redundancy)
Microsoft™ Mouse, 104-key keyboard
Microsoft Windows NT™ Server 4.0 (10-user license)
Intel LANDesk™ Server Manager 2.52
Integrated hardware instrumentation
Dedicated server technical support, 7x24
5-year/3-year Micron Power™ limited warranty
1-year next-business-day on-site service
NOS Support (3 incident
resolutions/1st year), 7x24

\$13,499

Bus. lease \$424/mo.

MICRON TRANSPORT™ Xpe

166MHz Mobile Intel Pentium processor with MMX
32MB EDO RAM (80MB max)
2.1 GB removable hard drive
12.1" active matrix color display, 800x600

STANDARD FEATURES

Intel 430MX Mobile PCI chip set
256KB L2 pipeline burst cache
PCI graphics accelerator, 2MB VRAM
8X modular CD-ROM drive
Pick-a-Point dual pointing devices
Sound Blaster 16-bit stereo sound
Built-in stereo speakers and microphone
Motorola Montana 33.6 fax/modem
CardBus- and zoomed video-ready
2 infrared ports, 1 front, 1 rear
S-video and NTSC-video capability
Built-in game port
Management Pak, Executive Travel Pak
2 modular expansion bays (hard drive, CD-ROM drive,
3.5" floppy drive, lithium-ion battery)
Custom nylon carrying case
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
5-yr/3-yr Micron Power limited warranty

\$3,599

Bus. lease \$123/mo.

MICRON TRANSPORT™ Xke

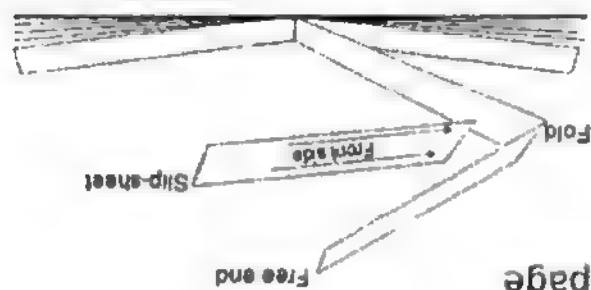
166MHz Mobile Intel Pentium processor with MMX
48MB EDO RAM
3GB removable hard drive
13.3" TFT XGA display

STANDARD FEATURES

Intel 430TX Mobile PCI chip set
512KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator, 2MB DRAM
20X modular CD-ROM drive with AutoPlay™
Pick-a-Point™ dual pointing devices
16-bit stereo sound
(supports surround sound and wavetable)
Built-in stereo speakers and microphone
Motorola Integrated 33.6 fax/modem w/full telephony duplex phone
CardBus- and zoomed video-ready
2 infrared ports, 1 front, 1 rear
S-video and NTSC-video capability, built-in game port
Management Pak, Executive Travel Pak
2 modular expansion bays (hard drive, CD-ROM drive,
3.5" floppy drive, lithium-ion battery)
Custom nylon carrying case
Microsoft Windows 95 and MS™ Plus! CD
Microsoft Office 97 SBE CDs
5-yr/3-yr Micron Power limited warranty

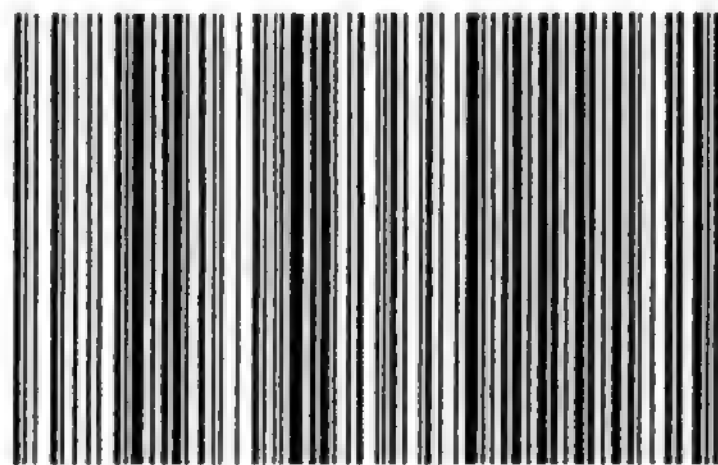
\$5,399

Bus. lease \$170/mo.



1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
 3. Slice the folded edge
 4. Close the page and slip-sheet

Inverted Foldout slip-sheet

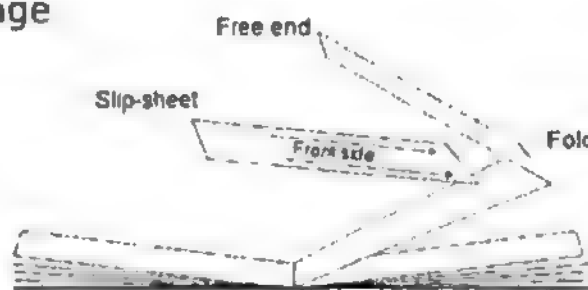


GbsSlipSheet-001

Folded edge of the page

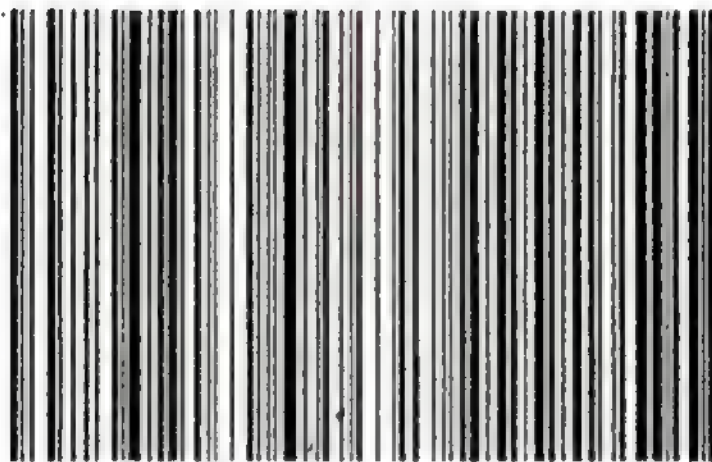
Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
 3. Slice the folded edge
 4. Close the page and slip-sheet



1. Follow instructions on the other side

Inverted Back



GbsSlipBack-0018

Back

1. Follow instructions on the other side

Sweet deals.

MICRON CLIENTPRO[®] XL

Intel 233MHz Pentium II processor (features MMX[™] technology)
32MB EDO RAM
2.1 GB SMART EIDE hard drive
17" Micron 17FGx, .26dp (16.0" display)

STANDARD FEATURES

512KB internal L2 secondary cache, DMI support
3.5" floppy drive
16X EIDE variable speed CD-ROM drive
3Com PCI 10/100 ethernet NIC
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Upgradable wavetable audio with speakers
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows NT Workstation
Intel LANDesk[™] Client Manager
5-year/3-year Micron Power limited warranty

\$2,549

Bus. lease \$87/mo.

MICRON VETIX Lx[®]

Intel 200MHz Pentium Pro processor
8MB ECC EDO RAM
4GB Ultra Wide SCSI-3 hard drive
15" Micron 15FGx, .28dp (13.7" display)

STANDARD FEATURES

Dual Pentium Pro ZIF sockets
256KB integrated L2 cache
Memory upgradable to 1GB (8 DIMM slots)
8 open expansion slots: 5 PCI, 2 ISA, 1 shared ISA/PCI
Integrated Adaptec PCI Ultra-Wide SCSI-3 controller
Integrated Intel EtherExpress Pro 100 controller
Integrated SVGA graphics
12X SCSI-2 CD-ROM drive
3.5" floppy drive
9 drive bays: 6 internal 3.5", 3 external 5.25"
Microsoft Mouse, 104-key keyboard
Integrated hardware instrumentation
Dedicated server technical support, 7x24
5-year/3-year Micron Power limited warranty
1-year next-business-day on-site service^{*}
NDS Support (3 incident resolutions/1st year), 7x24

\$5,099

Bus. lease \$160/mo.

MICRON CLIENTPRO MTe

Intel 166MHz Pentium processor with MMX
16MB EDO RAM
2.1GB SMART EIDE hard drive
15" Micron 15FGx, .28dp (13.7" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS, DMI Support
3.5" floppy drive
3Com 3C905 network adapter
Integrated S3 VIRGE/DX graphics accelerator, 2MB EDO RAM
Integrated wavetable sound
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95
Intel LANDesk[™] Client Manager
5-year/3-year Micron Power limited warranty

\$1,549

Bus. lease \$53/mo.

MICRON TRANSPORT VLx

133MHz Intel Pentium processor
16MB EDO RAM (40MB max.)
1.4GB hard drive
16X modular CD-ROM drive
Li-Ion battery
12.1" TFT SVGA, 800x600 display

STANDARD FEATURES

Intel 430MX PCI chip set
256KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator
MPEG compatible
Zoomed video-ready
Touchpad pointing device
16-bit stereo sound
Built-in stereo speakers and microphone
2-way infrared port
Modular floppy drive (flexible bay swappable with CD-ROM)
Microsoft Windows 95 and MS Plus!
5-year/1-year Micron limited warranty

\$2,499

Bus. lease \$85/mo.

^{*} On-site service for the Vetix server is provided by Digital Equipment Corporation and is optional.

Appealing options.



MULTIMEDIA OPTIONS

32 voice wavetable stereo sound card	\$59 ¹
32 voice wavetable stereo sound card with 2MB RAM	\$99 ¹
Advent A1270 Powered Partners stereo speakers	\$79
Advent A1370 Powered Partners stereo speakers with subwoofer	\$199
Microsoft [®] SideWinder 3D Pro joystick	\$59
Microsoft SideWinder gamepad	\$39

STORAGE/MEDIA OPTIONS

Adaptec 2940U Ultra SCSI Fast-20 controller	\$100
upgrade from system with standard Ultra SCSI Fast-20 controller	
Plextor 12/20 Plex 3MB/sec SCSI internal CD-ROM drive	\$100 ¹
upgrade from system with standard EIDE CD-ROM drive	
Imaging Jaz SCSI drive with 1GB removable cartridge	\$299 ¹
Imaging ZIP IDE drive with 100MB removable cartridge	\$99
Imaging 6-pack of 100MB Zip cartridges	\$89
Imaging Ditto 2000 (1.2/2GB)	
Travan tape backup drive with tape	\$149
Imaging Ditto 3200 (1.6/3.2GB)	
Travan tape backup drive with tape	\$199
Sony 4/8GB SCSI DDS-2	
tape backup drive with tape and software	\$899 ¹
Coyote ARCserve with Inoculan [®] (for servers)	\$499
Mytek dual channel Ultra-Wide SCSI-3 RAID caching controller with 4MB ECC RAM	\$899

COMMUNICATION OPTIONS

33.6 internal data/fax modem	\$99
33.6 internal data/fax modem, speakerphone, voice mail	\$119 ¹
33.6 external data/fax modem	\$299
56Kbps technology modem ²	\$99

NETWORKING OPTIONS

3Com 3C509B EtherLink III ISA combo network adapter	\$79
3Com 3C900 EtherLinkXL PCI combo network adapter	\$99
3Com 3C905 Fast EtherLinkXL 10/100 PCI	
TPD network adapter	\$99
3Com OfficeConnect Hub 8/TPC	\$149
3Com OfficeConnect Switch 140	\$969

SOFTWARE OPTIONS

EdVenture Pak: Sheila Rae the Brave, Putt-Putt Saves the Zoo, Reader Rabbit's Reading Development Library 1, Freddie Fish and the Case of the Missing Kelp Seeds, and the Thinkin' Things Collections 2 ¹	\$69
Quicken Financial Pak: Quicken Deluxe, Quicken Financial Planner, Quicken Parents' Guide to Money, Quicken Family Lawyer ¹	\$69
CorelDRAW 7 ¹ (full retail version)	\$299
Corel WebMaster Suite ¹ (full retail version)	\$99
Novell Intranetware 4.11, 5-user license, for Netx Lite only	\$699

HP PRINTERS

HP DeskJet 692c printer	\$319
HP DeskJet 870Cxi printer	\$419
HP LaserJet 6Lxi printer	\$429
HP LaserJet 6P printer	\$799

DISPLAY/VIDEO OPTIONS

17" Hitachi SuperScan CM630 (15.9" display) .26dp color monitor	\$150 ¹
21" Hitachi SuperScan CM801 (20.0" display) .26dp color monitor	\$650 ¹
Number Nine Imagine 128 series II video card, 1MB VRAM	\$299 ¹
Number Nine Imagine 128 series II video card, 8MB VRAM	\$549 ¹

TRANSPORT OPTIONS

MicronDock [™] multimedia port replicator: ethernet 10BT LAN adapter, SCSI-2 port, S-video and NTSC-video output, built-in stereo speakers, infrared port, headphone, microphone, line-in jacks, parallel, serial, VGA and 2 PS/2 ports (with warm dock and built-in game port - available on XPE models only)	\$299
Micron [™] Executive [™] desktop package: matching black 17" monitor (16.0" display), mouse, mousepad and keyboard (can be used with or without MicronDock)	\$699
Motorola Montana 33.6 fax/modem supports regular telephone connections, cellular phones and two-way paging devices	\$259

SCANNER OPTIONS

HP Scanjet 5s sheetfed scanner	\$269
HP Scanjet 5p flatbed scanner	\$399
HP Scanjet 4c flatbed scanner	\$799

DESKTOP EXTENDED SERVICE OPTIONS

Optional 1st year on-site service ¹ coverage included	
2nd year on-site service coverage	\$79
2nd and 3rd year on-site service ¹ coverage	\$99

Other service options may be available, ask your system consultant

SERVER EXTENDED SERVICE OPTIONS

2nd and 3rd year next-business-day ¹ on-site service coverage ¹	\$99
4-Hour response ¹ on-site service coverage ¹ (8am-5pm, M-F), 3 years total	\$798
4-Hour response ¹ on-site service coverage ¹ (24-hours, 7 days per week), 3 years total	\$998

Other service options may be available, ask your system consultant

NOTEBOOK EXTENDED SERVICE OPTIONS (N/A only)

2nd and 3rd year parts and labor ¹ ; 3-business-day turnaround for 3 years	\$269
2nd and 3rd year parts and labor ¹ ; 7-business-day turnaround for 3 years	\$209

OTHER OPTIONS

APC Per7T surge suppressor	\$39
APC Pro7T surge suppressor	\$59
APC Smart-UPS 700 with PowerChute plus software	\$389
APC Smart-UPS 1000 with PowerChute plus software	\$529
Microsoft Natural Keyboard upgrade from standard keyboard	\$49

¹ Upgrade from system with standard 16-bit stereo sound card
² Requires SCSI host adapter
³ Requires sound card
⁴ Upgrade from system with standard Micron 17" 200Hz 36" display color monitor
⁵ Upgrade from system with standard 64-bit 4MB video card
⁶ 1st year on-site service is available in the United States and is limited to Canada from third-party service provider per customer's commitment with provider
⁷ 2nd year and 3rd year offerings are available in the United States only
⁸ Extended services, if purchased after system shipment may have a higher cost
⁹ Services will be scheduled, whenever possible, for the next business day after parts are received by the customer
¹⁰ Available in certain locations, ask your system consultant for details
 Some options and accessories available only with system purchase only

¹ Available only on desktop and notebook systems with Microsoft Windows 95.

² Minimum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and observed transfer rates may be less than the maximum potentials.

MICRON POWER WARRANTY

5 year limited warranty on microprocessor and main memory
 3 year limited parts-only system warranty (1-year for Transfer[®] W.L.T.)
 1, 2 or 3 year optional on-site service agreement for Micron desktop and server systems
 30 days of free Micron-supplied software support for Micron desktop systems, 3 optional network operating system incident resolutions included for Micron server systems
 30-day money back policy
 24-hour technical support
 The foregoing is subject to and qualified by Micron's standard limited warranties and terms and conditions of sale. Terms and conditions of sale may vary for specific configurations. Copies of the limited warranties may be obtained on our Web site or by calling Micron.



Micron Sales Hrs: Mon-Fri, 6 am-10 pm,
 Sat, 7 am-5 pm (MT) Technical Support
 Available 24 Hours A Day, 7 Days A Week
 Toll free from Mexico: 95-800-708-1755
 Toll free from Canada: 800-708-1758 • Toll free from
 Puerto Rico: 800-708-1756 • International Sales:
 208-893-8970 • International Fax: 208-893-7393

Call now to order.
 800-707-2329
 www.micronpc.com



©1997 Micron Electronics, Inc. All rights reserved. Micron Electronics is not responsible for omissions or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice; prices do not include shipping and handling and any applicable taxes. 30-day money-back policy does not include return freight and original shipping handling charges. Applies only to Micron brand products and begins from date of shipment. All sales are subject to Micron Electronics current terms and conditions of sale. Lease prices based on 36-month lease. The Intel Inside Logo and Pentium are registered trademarks and MMIO is a trademark of Intel Corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies.

CONFIGURED FOR YOUR LIFE

First Looks



Sceptre FT15

Street price: \$2,500

Sceptre Technologies, Inc., City of Industry,
CA; 800-788-2878, 626-369-3698

www.sceptretech.com

Circle 413 on reader service card.

The monitor's image quality is competent, although it does contain some flaws. There are weaknesses in its usability, but you can work around them. The unit's price is lower than most here, but it's not low enough to be an important factor. This makes the HP 1024 LCD monitor an acceptable—not a standout—choice.

NEC Technologies, Inc.

MultiSync LCD400

NEC Technologies has one of the strongest reputations in the industry for computer monitors, so it should come as no surprise that its 14.1-inch LCD monitor lives up to that standard. At a street price of \$2,700, it's the most expensive unit here. But the MultiSync LCD400—our Editors' Choice in this roundup—leads the pack in ease of use and image quality.

The MultiSync was the only monitor that did not require an external power brick; a standard power cord plugs directly into the back of the chassis, where you'll also find an easy-to-reach standard VGA con-

nect. All settings are made with digital controls on the front panel. Even though the product manual describes all the options, the on-screen menus are intuitive and easy to use without referring to the documentation.

The screen's image quality is excellent. In general, the brightness uniformity was satisfactory, although there was a slightly brighter stripe near the bottom of the display. Color uniformity was excellent, with no noticeable discontinuities in either color or gray gradients. The image was rock-steady on fine patterns, without any jitter or pixel roll. There was a slight horizontal streaking with white or black areas on a gray background, but most users won't even notice. Our evaluation unit did not have any light or dark pixel flaws.

If there is a weak point in the product, it's that NEC does not have a simple policy about how many defects are acceptable. According to the vendor, there is a "complex rule based on the count and location of defects." Nevertheless, NEC's three-year parts and labor warranty (except for the backlight, which is covered for one year) should give potential buyers extra confidence.

The only other drawback to the MultiSync is that it automatically scales lower-resolution images to fill the screen; you don't have the option of showing the images with one LCD cell per pixel. Since most users will run this monitor with the full-resolution 1,024-by-768 signal, this shouldn't be a problem.

If you are in the market for one of these monitors, chances are you won't mind paying \$100 to 200 more for a top-quality image. If this is the case, then the MultiSync LCD400 is the LCD monitor for you.

Sceptre Technologies, Inc.

Sceptre FT15

Attention fashion fans: The FT15 from Sceptre Technologies comes in your choice of either a white or dark-gray housing, so you can pick the one that goes best with your decor. This 14.5-inch monitor (\$2,500 street) provides a fairly good image and features set, making it an acceptable though not outstanding choice.

Setup is straightforward. You make your choices from the easy on-screen configuration menu using front-panel buttons. The front panel also has a roller control that you use to set the volume of built-in speakers; there is no tone control and no mute button, and the tonal range of the speakers is limited but adequate for most office uses. You can easily slide the display panel off of its tilt stand for mounting on a wall.

Our evaluation unit came with two pixel defects—one bright and one dark. Sceptre has one of the best replacement policies in the group: If there are more than six defects, Sceptre will replace the monitor.

The image quality was very good. The screen brightness was generally uniform, aside from a dim region in the upper left corner of the panel. The color and gray gradients showed a few uneven spaces, and there was some noticeable horizontal streaking on high-contrast images. On some finely patterned images, there was pronounced jitter and pixel roll. The Sceptre FT15 lets you choose between scaling up lower-resolution images to fill the screen or displaying them in a one-cell-per-pixel mode for a smaller but sharper image.

The fact that the Sceptre entry has a comparatively low street price is not likely to be much of a factor in your buying decision.

The convenience of the integrated speakers and removable stand will be attractive to some buyers, as will the tight policy on bad pixels. The Sceptre's image is about average for the group, making it a reasonable choice.

ViewSonic Corp.

VP140 ViewPanel

The 14-inch VP140 ViewPanel from ViewSonic (\$2,500 street) is backed by an excellent warranty and replacement policy, which is an important part of the product's appeal. Its image quality was average for this competitive group, and its brightness uniformity was very impressive.

There were some flaws in the quality of this monitor's image. The most noticeable was jitter and pixel roll on fine-pattern images. There was also visible horizontal streaking on some high-contrast images and uneven areas in the lower-intensity ranges of color and gray gradients. Otherwise, the images were very good, with excellent brightness uniformity.

Our evaluation unit came



NEC MultiSync LCD400

Street price: \$2,700

NEC Technologies, Inc., Itasca, IL; 800-632-4636, 630-467-5000

www.nec.com

Circle 412 on reader service card.



HAS IN REBATE
 \$32 OFF purchase
 of Video Kit
 \$32 OFF purchase
 of Video Modem
 or Video Camera
 by 10/31/97



1 Other end of connection must also be camera-equipped to see called party. Compatible with any standard H.324, or VDOPhone internet video software.
 2 All x2 products are capable of 56 Kbps downloads however due to FCC rules which restrict power output current download speeds are limited to 53 Kbps. Actual speeds may vary. Uploads from user to provider travel at speeds up to 28.8 Kbps. An x2-capable modem, an x2-compatible analog phone line and an x2-capable Internet service provider are required. See www.usr.com/x2 for details.
 3 Actual performance subject to line conditions and Internet traffic.
 ©1997 3Com Corporation. All rights reserved. U.S. Robotics and the U.S. Robotics logo are registered trademarks and Bigpicture, the bigpicture logo, RapidComm, x2 and the x2 logo are trademarks of 3Com Corporation and its subsidiaries. All other product names are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies. Product specifications subject to change without notice. Contact your U.S. Robotics representative for current product information.
 #2557 7797

There are only so many emotions you can capture on a keyboard.

Your complete videophone system that makes
being online truly interactive.

**bigpicture
video**

Today you're feeling excited, with a little hint of frustration and slight agitation. Now, how are you going to express those emotions using a semi-colon, a colon and a parenthesis?

The Bigpicture™ Video Kit from U.S. Robotics provides all the latest technology for full video capabilities on your computer. You can make video phone calls. Capture, edit, and manipulate video. Send video e-mail, and see and speak with others on the Internet at the same time.¹ Or, for even better performance, you can make point-to-point videophone calls over standard analog phone lines.

The Bigpicture Video Kit is an all-in-one video system that includes a top-of-the-line, high-quality color camera with superior focus and built-in microphone for true videophone capability.

Included is a video-enhanced U.S. Robotics 33.6 Kbps voice/faxmodem which lets you download and transmit your audio and video at incredible speeds.

And if you want to go even faster, your new modem can be upgraded to download information

at speeds up to 56K² with new x2™ Technology from U.S. Robotics. This revolutionary new development lets you download significantly faster than 28.8 modems can, making it ideal for video applications.

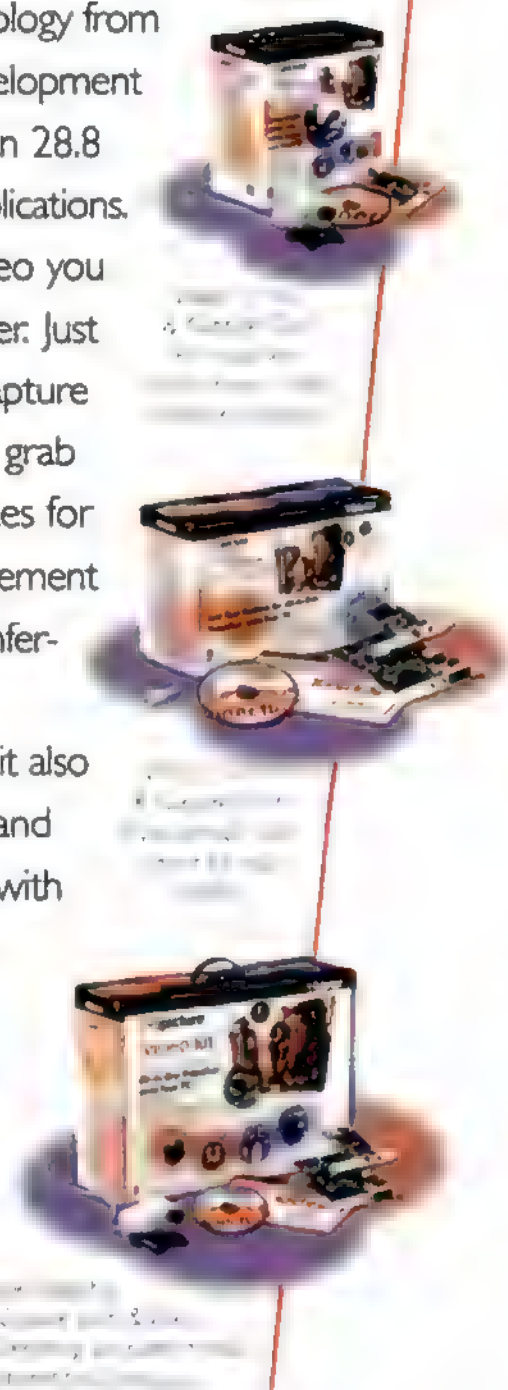
You can even send pictures and video you take with your own VHS home camcorder. Just use the video capture card, which can capture video at up to 30 frames per second, to grab moving images directly from those sources for transmission over the Internet, or for placement on your Web page. You can also videoconference at up to 15 frames per second.³

The U.S. Robotics Bigpicture Video Kit also comes with the latest software to edit and manipulate your video footage. Included with Bigpicture are Asymetrix® Digital Video Producer,[®] Kai's Power GOO™ Special Edition, RapidComm™ Video, VDOPhone Internet, VDOLive and everything you need for complete communication on your computer.

Call 1-800 DIAL USR for the dealer nearest you, or visit us at www.usr.com/bigpicture and let us show you how really cool the Internet can be.

Bigpicture Video from U.S. Robotics. Because unfortunately, :-) can only say so much.

U.S. Robotics®



First Looks

without any pixel flaws. ViewSonic has the best replacement policy of the group in this regard—more than six pixel flaws or a single pair of adjacent flawed pixels will qualify the monitor for replacement. The monitor is also notable for its three-year warranty.

Like the HP 1024, the ViewSonic monitor has a removable hatch on the back of the case to cover the cables. The hatch is just one piece and easier to handle than HP's system. The monitor is a snap to configure, thanks to an intuitive on-screen menu system and large, easy-to-use buttons on

the front panel. The same buttons that control the on-screen menus can also be used to control the brightness and contrast settings. Lower-resolution images are automatically scaled to full-screen size; you do not have the option of a one-cell-per-pixel mode with this panel.

The monitor supports Windows 95's Display Data Channel (DDC) for automatic bidirectional communication with your computer's graphics adapter as well as Windows 95's Plug-n-Play features. The VP140 ViewPanel also comes with a Windows 95 .INF configuration file as well as

software for VESA DPMS (Display Power Management System) support under Windows 3.x and DOS.

On the whole, the VP140 creates decent images, and the company warranty coverage is the best of the group. Although it may not be the best of the bunch, it still is a very attractive choice. □

ViewSonic VP140 ViewPanel

Street price: \$2,500

ViewSonic Corp., Walnut, CA; 800-888-8583,
909-869-7970

www.viewsonic.com

Circle 414 on reader service card.



GRAPHICS SOFTWARE

Goof-Proof Publishing

Design Intelligence's i publish can transform anyone into a page-layout pro.—By Luisa Simone

Design Intelligence's new entry-level graphics program, *i publish* (introductory street price, \$100; downloadable version, \$90), brings forth a new desktop publishing paradigm in which documents are "smart," so that creating them is easier.

An *i publish* layout already knows the correct size and position of each page element (for example, a banner component is always placed along the top of a flyer). Better still, *i publish* knows how to alter elements when you choose a new layout, so repurposing a printed publication for the Web is as simple as choosing an appropriate screen layout.

This intelligence extends to individual objects. A text frame in *i publish* not only will format the words it contains with a particular font, leading, and alignment, but will also dynamically reduce the point size to fit all the copy into the frame.

The program simplifies and automates document creation with a unique HTML-based interface. The right side of a split screen contains the current doc-

ument, and the left side contains the control panel, which is integrated with Microsoft Internet Explorer.

Four tabs in the control panel—Start, Grab, Design, and Publish—correspond to picking a layout, importing content, choosing design schemes, and generating final output. Plenty of innovations make assembling a document easier. For example, the import function lets you drag and drop text

and pictures from your local disk, the network drive, or the Internet into waiting placeholders. And instead of making dozens of formatting choices, you simply select four predefined schemes—for color, graphic effects, font specification, and paragraph styles.

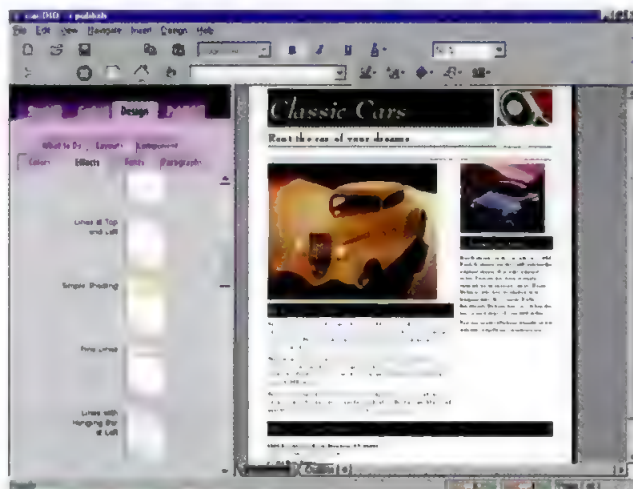
Several nifty features deserve special mention. A design meter at the bottom of the page warns you when your document is getting too dense. And instead of manually cropping a picture, you tell *i publish* what area to emphasize and it will provide the best fit for the layout. The program recognizes Web URLs in text, converting them to live hyperlinks when

you publish a Web page.

Despite its many strengths, *i publish* has several limitations. The program works *only* with versions 3.01 and 3.02 of Internet Explorer. If you use version 4.0 or another browser, you must install a resident copy of IE, which is supplied on the CD. Also, *i publish* imports only bitmapped graphics. And although newer bitmapped formats (such as Flash Pix and PCD) can contain multiple resolutions, *i publish* usually resizes bitmapped graphics irrespective of resolution.

Also, certain design effects—such as irregular text wraps—are beyond this product's capabilities. It provides no layout options for custom-size documents, nor can it produce four-color or two-color separations.

If you can accept the "one from column A, one from column B" approach to DTP, you'll find that *i publish* lets you forget about the medium and concentrate on the message. *i publish*. Street price: \$100; downloadable version, \$90. Requires: 16MB RAM, 25MB disk space, Microsoft Windows 95 or Windows NT 4.0 or higher, Microsoft Internet Explorer 3.01 or 3.02. Design Intelligence Inc., Seattle; 888-278-2574; fax: 206-343-7750, www.design-intelligence.com. Circle 408 on reader service card.



AUTOMATED DESIGN: The *i publish* control window (left) uses tabs, icons, and HTML links to walk you through the design process.

SCSI for your desktop.

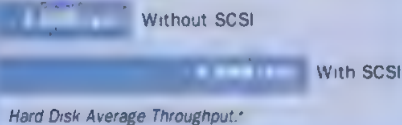
BONE rattling throughput.

Do more. Faster.

Connect to a

SCSI hard drive.

SCSI makes you more productive.



To see the proof, visit www.adaptec.com/US/000001

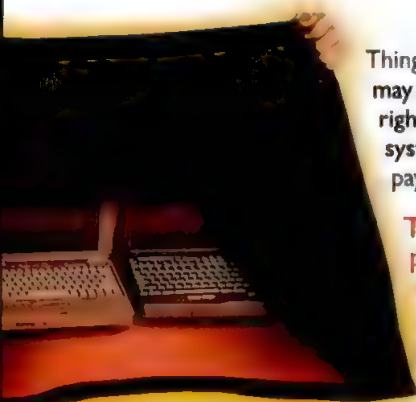
adaptec

*For information by fax, dial 1-408-557-7150. Request document no. 11460. *SCSI drive: Western Digital WDE2170 with Adaptec AHA-2040UW SCSI card. IDE drive: Seagate ST52520A. Dell Pentium Pro 200 PC: 32MB RAM. Intel chip set R2711NR PCI bus master IDE controller, Windows NT® Workstation 4.0, ATI graphics accelerator Mach 64, Adaptec Threadmark™ benchmark 2.0. ©1997 Adaptec, Inc. All rights reserved. Adaptec, Threadmark, AHA, the Adaptec logo and Tagline are trademarks of Adaptec, Inc., and may be registered in some jurisdictions. Windows NT is a trademark of Microsoft Corporation, used under license. All other trademarks belong to their respective owners. Always drive responsibly.

“I don’t know
how he **does it**, but



Maurice, my account manager at **CDW**,
always comes up with **product**
alternatives
”
that save my company money.



Things aren't always what they seem. What may look like a real steal may be downright unproductive for your company's system. Or you could be wasting money paying for something you don't need.

There's someone at our place who can help you sort it all out.

He's your CDW account manager. And once he gets to know you, your company's purchase history and your system, he can turn you on to product options that are more cost-effective and productive for your company. And save you a lot of time and aggravation in the process.

Get more than just a great price.

For example, he'll answer your toughest compatibility questions before they become problems. Get you the **free tech support** you need before you need it. And, of course, line up the right price for you.

So give us a call. We'll set you up with your own product options expert. A business computer specialist who knows what's happening with all the different products from all the different

manufacturers. That way, your company can choose from a huge selection of brand-name products like **IBM**®, **Compaq**®, **Hewlett-Packard**®, **Toshiba**® and **Microsoft**® at the best prices, in stock, ready for overnight delivery, and easy credit. You'll also get someone who can help you make the most of it all. And some honest, friendly, professional advice that will save you more than money.

Call today and get some free, objective advice and a free CDW catalog.

Check out some of our products and prices in the back of the magazine. Then give us a call. We'll send you our complete catalog. Or check us out at **www.cdw.com**. We think you'll discover that when it comes to getting the right, unbiased advice, as well as the right price, CDW is your only viable alternative.



**COMPUTER
DISCOUNT
WAREHOUSE**

*The right price.
The right advice.*

CIRCLE 360 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

800-761-4239 See our ad in the back



**COMPUTER
DISCOUNT
WAREHOUSE**

**The right price.
The right advice.**

Get more done

**HURRY—
OFFER ENDS
9/30/97!**

CDW®

Exclusive



CDW EXCLUSIVE!
\$75
REBATE*

Microsoft

**A NETWORK OPERATING SYSTEM FOR
YOUR MOST DEMANDING BUSINESS NEEDS**

Windows NT Server V4.0

Windows NT reliability with the ease of use of Windows 95

Microsoft Windows NT Server V4.0 is the easiest network operating system to set up, deploy and manage. And it's the cost-effective choice, too. Its scalable application platform will grow right along with your business. And, because business these days means the Internet, you'll be glad to know that Windows NT Server V4.0 is the only network operating system with built-in web services.

- Easy set-up, deployment, management and use
- One platform for e-mail, file server, databases and communications
- Supports over 5,000 hardware platforms
- Integrates seamlessly with your existing systems, including NetWare®
- Built-in Internet, intranet and communications services
- Includes web services: FrontPage and Internet Information Server
- Support for dial-up networking
- Supports any web browser

CD Upgrade + 5 client licenses	\$284.43*	CDW 73214
CD Upgrade + 10 client licenses	\$404.72*	CDW 73218
CD Competitive upgrade + 5 client licenses	\$284.43*	CDW 73215
CD Competitive upgrade + 10 client licenses	\$404.72*	CDW 73217
CD Upgrade + single client license	\$15.48	CDW 73209
CD Single client license	\$29.96	CDW 73211

*After \$75 CDW rebate with purchase of Microsoft Windows NT V4.0 (listed above). Purchasers will receive an invoice copy for proof of purchase and rebate coupon for eligible products. Return completed rebate coupon and invoice to CDW and a \$75 credit rebate will be placed on customer account good toward future CDW purchases. No cash refunds. Credit expires 6/30/98. Offer valid 8/5/97 through 9/30/97.

Internet connectivity requires access services from an Internet access provider. Contact your local access provider(s) for rates, terms and conditions.

800-761-4239

Order from CDW® today and use it tomorrow!

www.cdw.com/cdw

© 1997 CDW Computer Centers, Inc.
200 N. Milwaukee Avenue, Suite 1100, Chicago, IL 60610
F0143118A 5/97

COMPUTER DISCOUNT WAREHOUSE™

A man with dark hair, wearing a red long-sleeved shirt and light-colored trousers, stands against a solid red background. He is looking towards the camera with a slight smile. The image is oriented vertically, matching the text layout.

when you purchase these **Microsoft** products

**GET ORGANIZED, GET CONNECTED
AND GET GREAT RESULTS—FAST!**

For Windows 95 and NT Workstation

CDW EXCLUSIVE!
\$75
REBATE**



CDW
COMPUTER
DISCOUNT
WAREHOUSE

Nobody does prices better than CDW

800-761-4239

©1997 CDW Computer Centers, Inc.
Marked Avenue, Vernon Hills IL 60061
PCM3188B 9/11

CIRCLE 114 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/subscribeLink 1200 N. Milwaukee Avenue, Vernon Hills, IL 60061



**For more of
the right
price and
the right
advice,
see our
ad in the
back of this
issue!**



First Looks

HAND-HELD PCs

Compact Power

Psion's Series 5 hand-held PC rivals Windows CE machines.—By Cade Metz

The release of the Microsoft Windows CE platform may have reinvented the hand-held computer, but ironically enough, one of the finest hand-held PCs on the market today does not even run Windows CE. Instead, the Series 5 runs the new EPOC32 operating system from Psion Software, Psion Computers' sister company. With this 32-bit, object-oriented OS running on an 18-MHz ARM RISC 7100 processor, the 12.5-ounce Series 5 offers a suite of standard office and PIM applications, a voice recorder, and seamless integration with the Explorer interface of your Microsoft Windows 95 or Windows NT 4.0 desktop PC. Not even the HP 320LX and the Philips Velo, the leading Windows CE hand-held PCs, afford such capability and convenience.

The \$699 version of the Series 5 contains 8MB of system memory (a version with 4MB sells for \$599). The unit typically runs on two AA batteries (for roughly 35 hours of life), with backup power provided by a small Lithium CR2032 disk battery. Although you can also use AC power, an adapter costs \$29.

The Series 5 is 0.9 by 6.7 by 3.5 inches (HWD). When opened, the touch-type keyboard slides an inch forward and the touch-sensitive, 640-by-240 backlit monochrome display comes to rest firmly against a rear support. When the Series 5 sits on a level surface, this rear support keeps the machine from tipping over when you touch the display with the stylus pen. This is a boon, considering that many hand-held displays

fall down when touched with only the slightest pressure. The Series 5 stylus pen is tucked away at the rear of the machine, and it is used to navigate EPOC32 and draw electronic images via the integrated Sketch application.

With full-VGA width and half-VGA height, the Series 5 display allows you to view standard documents without having to scroll back and forth horizontally. You can backlight the display

does support multitasking. The Open Files/Programs interface—accessed by pressing on the top right-hand corner of any window—allows you to toggle between applications as well as close them. To the left of the display, four more permanent icons provide quick access to commonly used OS functions. You can increase or decrease the size of text and icons, send files through the unit's IrDA port, access an

ware, a financial calculator, an expense-report package, and two games. Users can create their own applications via Psion's programming language OPL and its integrated OPL editor, which is designed for use by developers; EPOC32 also supports Microsoft C++ and the Java development environment. An HTML 3.0-compatible Web browser and a POP3 e-mail client (which can be used in tandem with either Psion's \$249 travel modem or its \$139 Type II PC Card Adapter) will be available in September.

Like its Windows CE-based competitors, the Series 5 is designed to be able to interact easily with your desktop PC and printer. After you connect

the hand-held device to your serial port and load PsiWin 2.0, all of your files and folders on the Series 5 can be accessed directly from Windows Explorer. You have full cross-platform file compatibility, because EPOC32 files are read by numerous versions of Corel Word Perfect Suite, Lotus SmartSuite, and Microsoft Office. In addition to viewing and editing documents, you can synchronize PIM files with either Microsoft Schedule+ or Lotus Organizer and back up or archive your data. The Series 5's IrDA port lets you print directly from the unit, or you can use the Parallel Print Link or combination solution docking cable and a Serial Printer Converter (the adapters for both are included).

The Series 5 is a bit too big and heavy to be carried in a jacket pocket, but it's still as portable as a notebook and pen—and much more versatile.

Psion Series 5. List price: With 4MB RAM, \$599; with 8MB RAM, \$699. Psion Inc., Concord, MA; 800-547-7466, 508-371-0310; www.pSION.com. Circle 409 on reader service card.



TOUGH TYPEABLE: The Psion's keyboard slides forward, allowing for bigger keys than on any Windows CE machine.

application's Windows-like menu bar, and cut, copy, and paste.

The Series 5 also is handy for voice recordings. Three external buttons (record, rewind, play), a microphone, and a rear speaker let you create and play back what Psion dubs Voice Note messages. When the Voice Note button is pressed, EPOC32 automatically launches its Record application, which saves your dictations to a common folder. The Record application also lets you adjust the system's volume and record sounds without using the external buttons. Such sounds and other pre-recorded clips are easily incorporated into the system's alarm, so the unit can be set to wake you or alert you to a meeting.

In addition to the primary applications accessible from the bottom of the display, the Series 5 currently ships with a spell-checker, a thesaurus, terminal emulation and file-transfer soft-

by pressing a key, even though the display is clearly visible in normal light. Just beneath the display, a series of icons provides access to all of the major Series 5 applications, which include a word processor, a spreadsheet, two PIM databases, the aforementioned Sketch, and a scientific calculator. Files created with these applications can be stored in folders that reside on the System screen, the Psion equivalent of the Windows 3.1 Program Manager. Nested files and folders can easily be sorted and arranged, and they exist as icons on a virtual desktop. The System screen also features a clock and a Control Panel that allows you to manage the EPOC32 operating system.

Visually, EPOC32 is in essence a Windows interface. It doesn't allow you to size windows, but it



DISCOVER WHY WHIRLPOOL CHOSE THE WORLD'S MOST PRODUCTIVE DIAGRAMMING TOOL.



"FlowCharter helped me quickly create a model for our new centralized operation."
—Randy Zimmerman
Process Manager

TAKE NEW FLOWCHARTER™ 7 FOR A FREE SPIN AT WWW.MICROGRAFX.COM/SPIN

Centralizing 26 service operations into 1 would send most executive's heads spinning. Not at Whirlpool® Corporation. With Micrografx FlowCharter, Whirlpool® Corporation developed a consolidation process that resulted in increased efficiency and productivity.

Whirlpool® Corporation is one of many organizations, both large and small, that use FlowCharter. In fact, 60 of the Fortune 100 corporations have found it to be the easiest, quickest and most productive diagramming tool for their business processes.

FlowCharter isn't just another diagramming tool. You can diagram any process across any number of pages, with intelligent lines that automatically re-route and shapes that quickly drop into place.

New FlowCharter 7 offers more powerful tools than the previous version — ABC FlowCharter. It includes revolutionary Living FlowCharts™ that turn static diagrams into dynamic interactive processes and CoolSheet™ Templates that jump start the most common diagrams.



FlowCharter 7 is also available in Graphics Suite, the only enterprise-wide graphics solution for today's corporation.

In short, Micrografx FlowCharter bolsters productivity, refines processes, streamlines quality initiatives, helps you attain ISO-9000 certification, and makes your business run smoother. Request a FREE full-working 30 Day Trial of FlowCharter 7 at www.micrografx.com/spin or call us at 1-888-643-0132.

Canada call 800-360-8484. For license pricing on Micrografx FlowCharter, please contact Micrografx directly or call your preferred corporate reseller. ©1997 Micrografx Inc. All rights reserved. All trademarks are owned by their respective companies.

Picture The Possibilities



Jack said, "I am sorry, Don.
Your Java™ is not 100% Pure Java.™
So your data is not safe.
Anyone can get to it. Anyone."

"Oh, no!" said Don.

"What about my trade secrets?"

"They are not so secret
anymore," said Jack.

built-in file protection

no non Java code

complete data security



Pure and Simple.

*To see how leading banks, freight carriers and telecom firms use
100% Pure Java, visit **<http://java.sun.com/100percent/benefits.html>**
or simply call us at **1-800-JAVASOFT.***

BREWED BY



CIRCLE 135 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

First Looks

DIGITAL CAMERAS

Two Cameras, Two Styles

The latest cameras from Kodak and Fujii differ in both style and price.—By Daniel Grotta & Sally Wiener Grotta

These days, buyers select digital cameras based on resolution, features, and price. Kodak's \$1,000 DC120 is the first entry-level digital camera to have a megapixel charge-coupled device (CCD) that translates into 1,280-by-960 resolution. This is only negligibly lower than the mid-range \$2,400 Fujix DS-300, which features a resolution of 1,280-by-1,000.

Both cameras come equipped with a 3X auto-focus zoom lens, macro capability, a built-in strobe, and a removable memory card. The question is, since the two cameras' specs seem so close, why does the Fujix unit cost \$1,400 more?

FUJIX DS-300

The Fujix DS-300 can be operated as a fully automatic point-and-shoot device or as a completely manual professional camera. Although larger and bulkier than most digital cameras (it shares the same body style, shape, and weight as the company's film-based GA645 camera), the DS-300 is surprisingly easy to handle and shoot, even one-handed. Despite its sophistication and user configurability, there are only seven buttons and controls.

Subjects are framed through an optical viewfinder. Though it has no LCD, the DS-300 has NTSC video-out and can attach to a television or a camcorder LCD for real-time, 30-frames-per-second (fps) display. In fact, using the video-out is the only way to frame and focus macro shots accurately. It also has the capability of outputting directly to several Fuji continuous-tone printers.

The DS-300 comes with a

nine-element noninterchangeable 3X auto-focus power zoom lens, the same optical design Fuji uses in its broadcast-quality camcorders. The 3X zoom can be automatically extended to 6X through hardware interpolation, although it marginally reduces image quality in the telephoto range. The zoom lever is conveniently located behind the shutter release.

Unlike the Kodak unit, the DS-300's f-stops are set mechanically instead of electronically, so varying the aperture opening will affect depth of field. In addition, the user can override the auto-focus to set the distance to the subject. White point (electronic color correction) may be set three ways: automatically, manually, or for strobe. It can be set manually for mixed lighting by holding a white card in front of the lens and taking a reading. The camera has a built-in hot shoe for synchronizing with studio strobe lights. This feature helped create perfectly lit and exposed images on our tests.

There are numerous shooting and saving options. The camera uses Type I or II PC Cards that save at speeds up to 1 fps. Images can be saved in 24-

bit color or monochrome and at various levels of compression (including a 3.5MB uncompressed TIFF file). For Web publishing, the resolution itself can be downsized to 640-by-480. For action or sports shots, the optional Extension Unit increases the burst-mode rate to 4.5 fps, providing a total of 12 frames.

The DS-300 captures

Extension Unit contains a SCSI interface plus RAM for burst mode. Shooting with external studio strobe lights can be accomplished by tethering it to the computer via the SCSI interface. The DS-300 also features a faster analog-to-digital converter and an improved image-processing algorithm, producing image quality that Fuji engi-



HIGH-DENSITY IMAGE: The Kodak DC120 can produce high-density, 3.6MB image files, which translates into finer quality photorealistic prints.



PIXEL PERFECTION: The Fujix DS-300 produced perfectly lit and exposed images on our tests, thanks in part to its built-in hot shoe for synchronization with studio strobe lights.

images with a noninterpolated 1.3-million-square-pixel CCD that employs a technology called vacancy transfer. Besides capturing far more data, vacancy transfer CCDs generate less noise than Bayer Pattern CCDs, which overlap four rectangular red, blue, or green pixels to produce six sampling points. The

neers claim is superior to that produced by the company's \$10,000 505a digital camera.

We were impressed with the DS-300's superb image quality. On our tests, it exhibited a very high degree of clarity and color accuracy, excellent detail in both highlights and shadows, and virtually no artifacting or

aliasing. It also produced excellent 8- by 10-inch interpolated prints on a Tektronix Phaser 450 dye-sublimation printer.

KODAK DC120

The DC120 is a compact, rugged, easy-to-use box-shaped camera that saves images to either 2MB of built-in memory or removable matchbook-size Compact Flash cards. For better stability, the shutter and zoom buttons are configured to make one-handed operation virtually impossible.

The DC120 is the first entry-level camera with megapixel CCD density, though technically its Matsushita-built CCD has only 836,400 pixels. Kodak claims the higher density because of the camera's Bayer Pattern. The Bayer Pattern CCD (which Kodak uses on all of its digital cameras, except for the DC40 and DC50) is an inexpensive way to achieve higher-resolution images. But the CCD's rectangular pixels tend to produce more noise (random pixels) and softer images, which have to be compensated for in software.



To boost image quality further, Kodak passed up JPEG compression in favor of its own proprietary .KDS format, which offers three levels of compression as well as the ability to save images without compression.

Selecting the various options—four image quality levels (uncompressed, fine, standard, economy), three flash modes (auto, fill, off), four exposure

settings (auto, +2 or -2 exposure compensation, and manual), three focusing modes (normal, spot, and macro), and self-timer—can be done quickly and easily from the six-button control panel. The LCD playback switch and programmable camera menu are selected in conjunction with the zoom and control buttons; they can be complicated unless you memorize the various button combinations. You can also store images in up to eight preset and user-customizable albums, an essential feature for companies with multiple users.

The DC120 has an optical viewfinder and a 1.6-inch LCD panel. Practically speaking, the LCD should be restricted to macro work only, because Kodak gave its LCD a refresh rate of only 3 fps to conserve battery power and save on manufacturing costs.

The DC120 accommodates an optional \$24.95 serial-to-PC flash adapter, so it may be synchronized with external studio strobe lights. Unfortunately, because the interface is serial, shooting live models while tethered from the computer is impractical (the interface can link at speeds of up to 230K, however). That's due to an unavoidable 10-second delay between the time when command to fire is given and the instant the camera snaps the picture.

One advance of questionable usefulness is the ability to select f-stops or shutter speeds manually. The camera's mechanical shutter is constructed so the f-stop automatically changes with each speed selected and cannot be decoupled. Except for bumping the shutter speed up to 0.002 seconds for action shots (which isn't particularly fast), the DC120's f-stops are produced electronically, not by a mechanical aperture, so stopping down will not increase depth of field.

What gives the DC120 an unassailable edge among entry-

SUMMARY OF FEATURES

Digital Cameras

■ YES ■ NO	Fujix DS-300	Kodak DC120
Street price	\$2,400	\$1,000
Resolution (pixels)	1,280 x 1,000	1,280 x 960
CCD resolution (pixels)	1,300,000	836,400
Lens	1/3.5-1/5.6, auto-focus, 3X power zoom	1/2.5-1/24, auto-focus, 3X power zoom
Macro (inches)	8.4-15.6	7.9-19.0
Exposure compensation	-0.9 to +1.8 (in 0.33-stop increments)	-2.0 to +2.0 (in 0.5-stop increments)
Shutter speed (seconds)	1/1,000-1/4	1/500-1/6
Selected manually	■	■
Aperture	1/3.5-1/11	1/2.5-1/24
Selected manually	■	■
Flash	Auto, fill, off, external PC shoe, optional off-camera slave unit	Auto, fill, off, M flash synchroization cable
Storage	Type I or II PC Card	2MB built-in RAM, optional 2MB Compactflash card
Number of pictures	High, 8, fine, 30; normal, 62; basic, 121 (with 15MB PC Card)	Uncompressed, 2, high, 7, standard, 14, economy, 20
Format	JPEG or TIFF	Proprietary KDC
File sizes	Decompressed, 3.5MB, high uncompressed, 2.5MB, fine, 668K, normal, 326K, basic, 1.65K	Decompressed, 3.6MB, uncompressed, 830K, high, 210K, standard, 120K, economy, 80K
Viewfinder	Optical	Optical and hinged 1.6-inch color LCD
Video out	NTSC	None
Macintosh/PC	■ ■	■ ■

level cameras is its higher-density image files. Although a typical 640-by-480 digital-camera image file expands to 1.1MB, the DC120 produces 3.6MB files. Selecting the no-compression option severely limits the number of shots that can be saved (two to the camera's built-in memory, seven on a 2MB card), but it produces a finer quality than the compressed modes. According to a conventional formula, a 3.6MB file can produce only up to a 5-by-7-inch 300-dpi print. But we used a print-to-fit command to output letter-size prints to the Tektronix printer. The DC120's file provided enough data to produce fully saturated colors (even when blown up to 8 by 10 inches) and a generally acceptable—though slightly soft—photorealistic print.

DIFFERENT CAMERAS FOR DIFFERENT APPS

Despite the cameras' virtually identical file sizes, the Fujix DS-300 produces much better

picture quality than the Kodak DC120. Although it is among the best digital cameras in its price range for shooting annual reports, weddings, or other quality-intensive applications, the DS-300 excels as a studio portrait camera in a multi-strobe environment.

On the other hand, we think that the DC120 is one of the best entry-level digital cameras available. As such, it is much better suited and certainly more affordable for smaller, less demanding requirements such as newsletters, Web pages, ID shots, and personal photos. **Fujix DS-300.** Street price: \$2,400; Extension Unit, \$1,000; 15MB card, \$500. Fuji Photo Film U.S.A. Inc., Elmsford, NY; 800-800-3854, 201-507-2500; www.fujifilm.com. *Circle 406 on reader service card.*

Kodak DC120. Street price: \$1,000. Eastman Kodak Company, Rochester, NY; 800-235-6325, 716-726-7260; www.kodak.com. *Circle 407 on reader service card.*

PROGRAMMING TOOLS

Delphi 3 Delivers Potent Programming

Borland simplifies RAD program development.—By Neil Rubenking

Borland's new Delphi 3 is a fantastic RAD programming tool, but only for serious developers. Delphi has never stopped pushing the cutting edge of RAD program development, and it accelerates it further with help from new features, additional components, and enhanced database support.

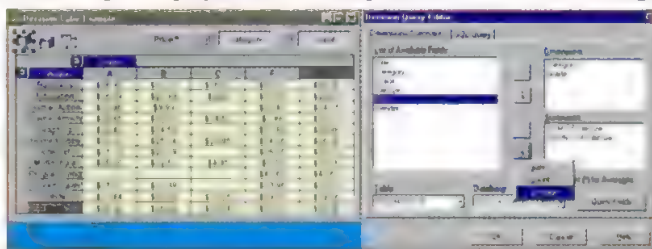
With this latest version, Delphi's reach extends to include Internet/intranet programming, the creation and use of ActiveX controls and forms, full support for Component Object Model (COM) and Distributed COM programming, and multitier

client/server design. The jewel in Delphi 3's crown is the DecisionCube and associated components. These components provide an interactive crosstab that can be viewed in grid or graphical form.

A simple menu selection can create a new Web Server Application; you get a choice of CGI executable, WinCGI executable, or server-based DLLs. A working knowledge of how the selected application type communicates with the system is required, but Delphi 3 insulates you from many painful details.

For example, the same server-based DLL will support Microsoft's ISAPI (Internet Services API) or Netscape's NSAPI (Netscape Server API). Built-in objects handle such server tasks as producing an HTML page, displaying database records in an HTML table, and responding to requests from the server. There are even objects for direct programming of socket services.

ActiveX components supercharge your Web site by running on the client system. Delphi 3 can automatically generate an ActiveX component from a Delphi component (or vice versa) and can turn a form into an ActiveX-powered applet. The ActiveX control wizard handles the details, including version information, type library creation, runtime property pages, and deployment of the component.



CROWN JEWEL: DecisionCube provides an interactive crosstab that can be viewed in a grid or in graphical form.

Delphi's emphasis on database programming continues with new flexibility. The Borland Database Engine can now reside on a middle-tier server rather than on every client. You can even skip the BDE and rely on ODBC or Btrieve instead.

Delphi 3 adds a number of new SQL links and database drivers, so if you don't find the driver you want, you can write your own with the Database Driver Development Kit.

NO END INSIGHT

The Code Parameters feature of Delphi's Code Insight cuts through the chaos of remembering correct parameters by automatically providing syntax for Windows API functions, Delphi functions, and user-defined functions. Code Completion does similar duty for the available properties, methods, and events for components.

In both cases, the Delphi-supplied information appears

only when you pause in your typing. The Code Templates wizard speeds creation of new code with a user-configurable pop-up menu that inserts common constructs like If-Then-Else blocks. Debugging is easier too, with ToolTip expression evaluation. When the program is paused, resting the mouse cursor on a variable or expression pops up a ToolTip with its present value.

Active Insight is the Borland name for Delphi 3's ActiveX component support. It also includes Active Forms (which are full-scale applets with an ActiveX interface) and Active Web

Deployment to simplify your company's software configuration and distribution.

Business Insight allows you to view and manipulate data from any local or remote source. The TeeChart object provides a variety of graphical views of data from any source. The latest version of Quick Reports (Delphi's report components) includes wizards to aid in report creation and integration with TeeCharts.

POWER BROKERS

The "broker" technologies included in Borland's MIDAS (Multitier Distributed Application Services) provide services that build on those intrinsic to Windows NT and DCOM. MIDAS allows centralizing of business rules in a multitier system and provides failover and recovery for mission-critical applications. The design portion of MIDAS is included in Delphi 3 Client/Server

Edition; the deployment cost starts at \$5,000 per server.

Remote Data Broker lets an application pass versatile cursor datatypes to the client. Business Object Broker handles lost or broken connections to business rules servers, providing location transparency for these middle-tier objects. Constraint Broker propagates database rules and validation constraints to the client, so data integrity is preserved even without a connection to the server.

Delphi's new Interface data type corresponds directly to a COM interface, which greatly simplifies the creation of ActiveX controls, shell extensions, automation servers, and other COM/OLE objects. Delphi's Interface objects are automatically initialized, reference-counted, and released. And since an object can support more than one interface, Delphi gains a kind of multiple inheritance. Delphi 3 generates typelib files as needed or reads a typelib file and generates corresponding Delphi code.

If you like Delphi, you'll love this new version. And if you don't use Delphi, its new features are sure to make you a convert.

Delphi 3. List price: Client/Server Suite, \$1,999; professional edition, \$799; standard edition,



LOOK FAMILIAR? This anagram-creation program shows a toolbar similar in design to Microsoft Internet Explorer.

\$99.95. Requires: 16MB of RAM, 60MB hard disk space, Microsoft Windows 95, Windows NT 4.0 (Service Pack 2), or Windows NT 3.51 (Service Pack 5). Borland International, Scotts Valley, CA; 800-233-2444, 408-431-1000; fax, 408-431-4122; www.borland.com. Circle 404 on reader service card.

IT'S LIKE COFFEE FOR YOUR COMPUTER!

**16 MEG MODULES
AS LOW AS \$78⁰⁰**

Find out how you can get the same performance and reliability as the world's best memory modules at a fraction of the cost. Call today for your free information kit.

30-pin DIMM		
1 MB	1 x 8	\$15
4 MB	4 x 32/36	\$39/\$43

72-pin DIMM		
8 MB	1 x 32	\$26
8 MB	2 x 32/36	\$47/\$69
16 MB	4 x 32/36	\$78/\$87
32 MB	8 x 32/36	\$162/\$181

72-pin SODIMM		
4 MB	1 x 32	\$30
8 MB	2 x 32	\$45
16 MB	4 x 32	\$84

144-pin SODIMM		
8 MB	1 x 64	\$46
16 MB	2 x 64	\$81
32 MB	4 x 64	\$275

168-pin DIMM		
8 MB	1 x 64	\$53
16 MB	2 x 64/72	\$84/\$98
32 MB	4 x 64/72	\$161/\$178
64 MB	8 x 64/72	\$322/\$354

Call us or visit our website for a complete listing and current pricing.



Government, school and corporate P.O.'s are also accepted.

Power-packed memory from Micron, one of the world's premier OEM suppliers, can shake the cobwebs off your beleaguered PC, giving you the speed and power to raise productivity and run multiple applications simultaneously. With Crucial memory your PC can more efficiently handle large graphics files and more quickly download video and software from the Net. Because it's direct from the factory, you're getting the same fully-tested, high-quality memory that went *into* your PC. And by eliminating the middleman, you gain direct access to the designers as well as technical engineers. Installation is a snap, too, so easy that you can do it during your next coffee break. Call our toll-free number or order on-line. Relief is just moments away.

- ✓ **COMPATIBLE** with all major PCs and printers - HP, Dell, Compaq, IBM, AST, Micron Electronics, Gateway 2000, Packard Bell, NEC, Digital, Acer and more!
- ✓ **30-day, money-back GUARANTEE**
- ✓ **FREE FedEx shipping***
- ✓ **Made in the USA**
- ✓ **LIFETIME warranty****
- ✓ **"IT'S A SNAP" installation guide**
- ✓ **FREE technical support**



TO ORDER CALL
1-800-932-4993
Monday - Friday 7 a.m. to 7 p.m., MST
Saturday 8 a.m. to 3 p.m., MST
Information available 24 hours a day:
www.micron.com/crucial

crucialTM
TECHNOLOGY
A division of Micron

Crucial Technology, 8000 S. Federal Way, P.O. Box 6, Boise, Idaho 83707-0006
Phone: 208-368-5092 Fax: 208-368-3342 International Sales: 208-368-5081, e-mail: crucial.sales@micron.com
Prices subject to change without notice. Prices indicated are for specific configurations. Call for current pricing. Corporate names and trademarks stated herein are the property of their respective companies. *Refer to the warranty for specific terms and limitations. **In the continental U.S. ©1997, Micron Technology, Inc.
CIRCLE 120 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink



Model	G773	P775
Dot Pitch	0.26mm	0.25mm
Recommended Resolution	1,024 x 768 @ 87Hz	1,280 x 1,024 @ 88Hz

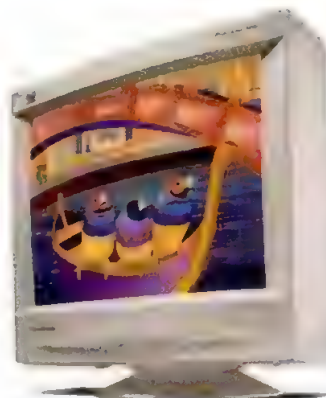
Introducing SuperClear.[™]

A monitor with an image so clear we had to trademark it.

SuperClear. It's the latest advancement in screen performance and, not surprisingly, it comes from ViewSonic[®], the biggest company in display technology and the leader in the 17" (various viewable) market.

The focus is on clarity.

The .26mm dot pitch G773 17" (16.0" viewable) monitor sets new standards for image clarity. The reason is our SuperClearscreen—ViewSonic's latest engineering breakthrough that combines the exceptional focus found in high contrast conventional CRTs with the bright, vivid colors associated with aperture grille CRT monitors. The result: Absolutely the clearest, brightest images and most vivid colors available on a 17" (various viewable) monitor. At any price. Period.



More specs, more selections, more solutions.

The G773, with 1,024 x 768 resolution at 87Hz, is perfect for general business, home and the internet. If your work requires even higher resolutions, we're also introducing the P775 17" (16.0" viewable) monitor for CAD/CAM, document imaging and prepress applications. This new monitor offers an eye-popping 1,280 x 1,024 resolution at an amazing 88Hz refresh rate.

Keeping an eye on the environment.



And, in keeping with ViewSonic's commitment to environmental concerns, both the G773 and P775 meet strict TCO '95 standards which reduce heat emissions, lower power consumption and mandate the use of recyclable parts. Compliance to TCO certification ensures that our monitors are environmentally and ecologically friendly.

To fully appreciate the clear advantages of the G773 and P775 though, you really need to see them in person.

For the dealer nearest you, call ViewSonic at (800) 888-8583 ask for agent 6537, or visit our website at: www.viewsonic.com



ViewSonic[®]
See the Difference!™

(909) 869-7976 Fax (909) 869-7958 • Internet: www.viewsonic.com
Specifications subject to change without notice • Copyright © 1997 ViewSonic Corporation, all rights reserved
Corporate names and trademarks stated herein are the property of their respective companies.

CIRCLE 117 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

First Looks

LASER PRINTERS

A New LaserJet Jewel

HP's LaserJet 6L makes 6-ppm printing an affordable venture.—By Edward Mendelson

Hewlett-Packard's LaserJet 6L (\$400 street price) restores HP to the leading edge in the low-priced laser printer market. This 6-ppm, 600-dpi model is the successor to HP's LaserJet 5L, a 4-ppm, 600-dpi unit that was outclassed in testing by 6-ppm entries such as Brother's HL720 and HL730 and Panasonic's KX-P6100 and KX-P6500.

The 6L's speed is in the same class with the aforementioned printers. Its speed is achieved through the use of a software-only, host-based printer driver that runs within your operating system and utilizes your PC's processor instead of the printer's slower processor.

A compact desktop model, the 6L weighs 15.9 pounds and measures 8.9 by 13.2 by 12.3 inches (HWD). The input and output trays both hold 100 sheets or 10 envelopes each, and a single-sheet input slot lets you print a sheet of letterhead followed by multiple blank sheets; transparencies and labels are also supported.

The front panel has three lights, one that lights in an error condition, another that indicates data being processed, and a

Ready light. You'll need the manual to figure out the exact meaning of various combinations of steady and blinking lights, but the Windows driver optionally displays detailed status messages.

One megabyte of memory ships with the printer; up to 8MB can be added by inserting a standard PC-RAM card into a single slot. The printer does not have a power switch, but it goes into sleep mode when not in use; you must wait 18 seconds to print a page when it wakes up again.

The host-based driver, which is tightly integrated with Windows, uses a proprietary technology developed by Microsoft and HP, not the GDI (Graphic Device Interface) technology used in many other low-priced lasers. Still, the 6L is not exclusively for Windows. For use with other operating systems and in Windows systems with less than 8MB of RAM,

the 6L supports HP's hardware-based PCL5e printer language with built-in scalable fonts (unlike the less-powerful PCL4 emulations built into most other printers in the same class).

In PC Labs testing, the 6L produced a Microsoft Word text file in 1:11 at 600 dpi, a speed equal to or faster than similar models. It was able to print our Freelance Graphics test pages in about three minutes, which was still much

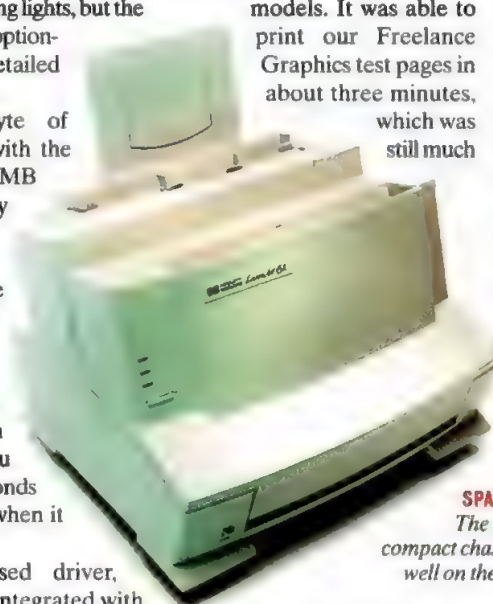
cludes options for scaling the printed output and for making fine adjustments in toner density, brightness, and contrast. The PCL5e driver has fewer options and lacks support for scaling. Output from both drivers was clean, sharp, and smooth, with the host-based driver producing slightly lighter graphics than the PCL5e version.

HP also announced (but won't ship until October) the HP LaserJet Companion, a \$249 sheet-fed gray-scale scanner resembling the Visioneer Paperport. It sits between any HP LaserJet 4, 5, or 6 printer and your computer. Pages scanned by the companion can be sent to the computer to be stored, faxed, or processed for OCR (a reduced version of Caere's OmniPage comes in the package) or sent to the printer to be copied. The 6L printer and Companion will be bundled for \$598.

With universal compatibility, clean output, and good performance, the LaserJet 6L is a wonderful

choice for home and small offices. But if you've never regretted buying an HP LaserJet, the 6L won't change that.

HP LaserJet 6L. Street price: \$400. Hewlett-Packard Direct Marketing Organization, Santa Clara, CA; 800-752-0900; www.hp.com. Circle 402 on reader service card.



SPACE SAVER: The LaserJet's compact chassis works well on the desktop.

slower than the time clocked by the Brother HL720 (1:20) and slightly slower than some other printers in this class. The PCL5e driver was about half as fast as the host-based driver in these tests, although it performed slightly faster in other informal tests.

The host-based driver in-

PERFORMANCE TESTS

6-ppm, 600-dpi Laser Printers



Compared with the cream of the crop from our latest roundup of personal and small-office laser printers (11/5/96), the HP LaserJet 6L performed well on our Microsoft Word and Excel tests using a host-based driver. On our Microsoft Publisher and Freelance Graphics

tests, however, the 6L scored significantly behind similar printers from Brother and Panasonic. Using HP's PCL5e driver, the 6L's performance slowed on all tests except the Publisher test. We tested on a Pentium/90-based HP Vectra running Windows 95 with 16MB of RAM and a 1GB Quantum hard disk.

Bold type denotes first place.

Minutes:seconds	Printer language (emulation) tested	Microsoft Word (5 pages)	Microsoft Excel (2 pages)	Microsoft Publisher (1 page)	Freelance Graphics (3 pages)
HP LaserJet 6L	Host-based driver	1:11	0:44	1:11	2:58
HP LaserJet 6L	PCL5e driver	2:40	1:04	0:53	3:56
Brother HL720*	Host-based driver	1:10	0:41	0:37	1:20
Brother HL730*	Host-based driver	1:13	0:42	0:37	1:20
Panasonic KX-P6500*	Host-based driver	1:02	0:34	0:32	1:51

* Reported for comparison.

◀ BETTER

◀ BETTER

◀ BETTER

◀ BETTER

A LAN COULD CARE LESS IF YOU'RE UNDERSTAFFED, OVERWORKED, OR EVEN EMPLOYED.



We can help. A server isn't here to hold your hand. It's here to perform millions of operations per second. That's why at AST,[®] we're here to help you every step of the way. With management software that notifies you if there's a problem. And with a dedicated server support staff that's ready to solve those problems 24 hours a day, 7 days a week. We even have an option that includes on-site technician response within 4 hours. Because, sometimes, a helping hand is exactly what you need. For more information about AST Manhattan[™] servers with Intel[®] Pentium[®] Pro processor, call 1-800-945-2278.



Manhattan S Series
200 MHz Intel Pentium Pro processor, dual CPU capability
256 KB or 512 KB cache depending on model
64 MB ECC RAM standard memory, expandable to 1 GB
SCSI CD-ROM standard on all models
Three channel PCI Ultra/Wide SCSI disk array controller (array models)
PCI Ultra/Wide SCSI-3 adapter (non-array models)
445-watt power supply
Intel EtherExpress[™] PRO/100B adapter
3-year on-site limited warranty
Optional GuardianCare[™] 4-hour on-site response program available
Fully certified for Novell[®] NetWare[®] and IntranetWare[®] and Microsoft[®] Windows NT[®]

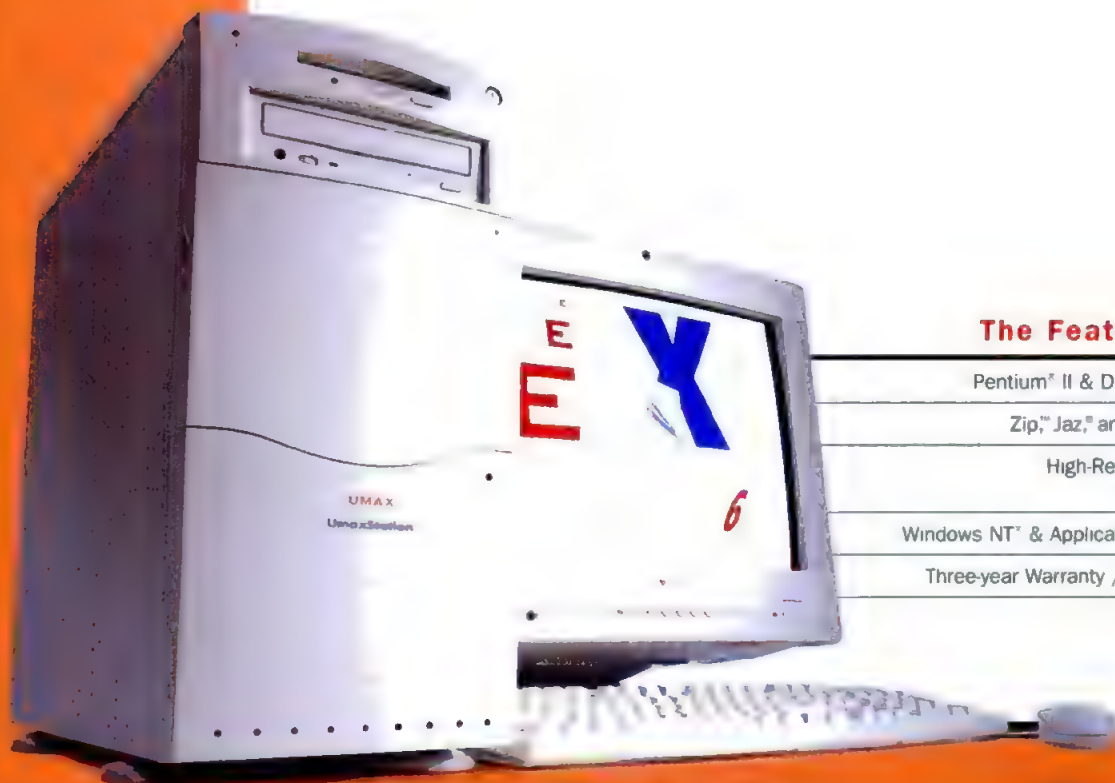


AST
COMPUTER

Working for your business.[®]

©1997 AST Research, Inc. All rights reserved. AST and the AST logo are registered trademarks. Working for your business and Manhattan are trademarks, and GuardianCare is a servicemark of AST Research, Inc. The Intel Inside Logo and Pentium are registered trademarks and EtherExpress is a trademark of Intel Corporation. Novell, NetWare, and IntranetWare are registered trademarks of Novell, Inc. Microsoft and Windows NT are registered trademarks of Microsoft Corporation.

CIRCLE 122 ON READER SERVICE CARD



The Features You Need:

Pentium® II & Dual Pentium II Processors

Zip™, Jaz®, and DVD Multimedia Drives

High-Resolution Display Adapters
& Flat Square Monitors

Windows NT® & Application Software from Adobe

Three-year Warranty / One-year Onsite Service

UMAX—GRAP

NT SYSTEMS DESIGNED FOR

UmaxStation 6000

- Intel 266MHz Pentium II processor
- 32MB EDO RAM/512KB Pipeline Burst Cache
- 4GB EIDE Hard Disk Drive
- DVD Multimedia/CD-ROM Drive
- 100MB Zip Drive, 3.5" Floppy Drive
- Matrox Millenium 4MB WRAM Graphics Card
- 17" Flat Square Color Monitor (15.6" v.a.)
- 56Kbps Data & Fax Modem
- 10/100TX PCI Ethernet Card
- Creative Labs 3D Sound, Audio In/Out & Mic ports
- Amplified Stereo Speakers
- Mid-tower Case with 250W Power Supply
- EPP/ECP printer port, (2) 16550 serial ports, (2) USB ports
- PS/2 Keyboard & Microsoft IntelliMouse
- Windows NT Workstation (Windows® 95 available)
- Adobe® PhotoDeluxe™, Adobe PageMill™ 2.0, Adobe Type Manager®, Lotus SmartSuite®

#56000.....\$3295

Business leases starting at \$93/month

UmaxStation 6200

- Intel 266MHz Pentium II processor
- 64MB EDO RAM/512KB Pipeline Burst Cache
- 5GB EIDE Hard Disk Drive
- DVD Multimedia/CD-ROM Drive
- 100MB Zip Drive, 3.5" Floppy Drive
- Matrox Millenium 8MB WRAM Graphics Card
- 17" Flat Square Color Monitor (15.6" v.a.)
- 56Kbps Data & Fax Modem
- 10/100TX PCI Ethernet Card
- Creative Labs 3D Sound, Audio In/Out & Mic ports
- Amplified Stereo Speakers with Sub-Woofer
- Mid-tower Case with 250W Power Supply
- EPP/ECP printer port, (2) 16550 serial ports, (2) USB ports
- PS/2 Keyboard & Microsoft IntelliMouse
- Windows NT Workstation (Windows 95 available)
- Adobe PhotoDeluxe, Adobe PageMill 2.0, Adobe Type Manager, Lotus SmartSuite

#56200.....\$3895

Business leases starting at \$110/month

UmaxStation 6400

- Intel 266MHz Pentium II processor
- 128MB EDO RAM/512KB Pipeline Burst Cache
- 5GB EIDE Hard Disk Drive
- DVD Multimedia/CD-ROM Drive
- 1GB Jaz Drive, 3.5" Floppy Drive
- ELSA Gloria-L 8MB VRAM/8MB DRAM 3D Graphics Accelerator
- 19" Multi-Step Dynamic Focus Color Monitor (18" v.a.)
- 56Kbps Data & Fax Modem
- 10/100TX PCI Ethernet Card
- Creative Labs 3D Sound, Audio In/Out & Mic ports
- Amplified Stereo Speakers with Sub-Woofer
- Mid-tower Case with 250W Power Supply
- EPP/ECP printer port, (2) 16550 serial ports, (2) USB ports
- PS/2 Keyboard & Microsoft IntelliMouse
- Windows NT Workstation (Windows 95 available)
- Adobe PhotoDeluxe, Adobe PageMill 2.0, Adobe Type Manager, Lotus SmartSuite

#56400.....\$5795

Business leases starting at \$164/month

Toll Free: 1-888-289-8629 Keycode #202

1-888-BUY-UMAX

www.umaxpc.com

GET CREATIVE

UMAX®

NT Systems for Creative Professionals

Umax understands that creative work requires a special kind of system. That's why we've drawn upon 10 years' experience to develop a new line of NT-based, Adobe-driven workstations that give designers, animators, illustrators, and production artists everything they need. The high-end **UmaxStation** models feature state-of-the-art dual Pentium II 266Mhz processors for maximum power and come bundled with Adobe's latest graphics applications. The **UmaxPC** line of value-priced systems includes many of the same graphics-ready components— Zip drives, high-end video cards, 56K modems— at very affordable prices. Whatever your plans, whatever your budget, we've got a graphics system that will inspire your creativity. These are the machines you need, from a company that knows how to build them.

HIGHS POWER

CREATIVE PROFESSIONALS.

UmaxStation 9000

- Dual Intel 266MHz Pentium II processors
- 64MB EDO RAM/512KB Pipeline Burst Cache
- 4GB EIDE Hard Disk Drive
- DVD Multimedia/CD-ROM Drive
- 100MB Zip Drive, 3.5" Floppy Drive
- Matrox Millenium 4MB WRAM Graphics Card
- 17" Multi-Step Dynamic Focus Color Monitor (15.9" v.a.)
- 56Kbps Data & Fax Modem
- 10/100TX PCI Ethernet Card
- Creative Labs 3D Sound, Audio In/Out & Mic ports
- Amplified Stereo Speakers with Sub-Woofer
- Mid-tower Case with 250W Power Supply
- EPP/ECP printer port, (2) 16550 serial ports, (2) USB ports
- PS/2 Keyboard & Microsoft IntelliMouse
- Windows NT Workstation (Windows 95 available)
- Adobe PageMaker® 6.5, Adobe Photoshop® 4.0, Adobe Illustrator® 7.0, Adobe PageMill 2.0, Adobe Type Manager, Lotus SmartSuite

#S9000.....\$4995

Business leases starting at \$141/month

UmaxStation 9300

- Dual Intel 266MHz Pentium II processors
- 128MB EDO RAM/512KB Pipeline Burst Cache
- Adaptec® 2940 Ultra-Wide SCSI-3 Controller
- 9GB SCSI Hard Disk Drive
- DVD Multimedia/CD-ROM Drive
- 1GB Jaz Drive, 3.5" Floppy Drive
- Matrox Millenium 8MB WRAM Graphics Card
- 21" DiamondTron Color Monitor (19.7" v.a.)
- 56Kbps Data & Fax Modem
- 10/100TX PCI Ethernet Card
- Creative Labs 3D Sound, Audio In/Out & Mic ports
- Amplified Stereo Speakers with Sub-Woofer
- Mid-tower Case with 250W Power Supply
- EPP/ECP printer port, (2) 16550 serial ports, (2) USB ports
- PS/2 Keyboard & Microsoft IntelliMouse
- Windows NT Workstation (Windows 95 available)
- Adobe PageMaker 6.5, Adobe Photoshop 4.0, Adobe Illustrator 7.0, Adobe PageMill 2.0, Adobe Type Manager, Lotus SmartSuite

#S9300.....\$7995

Business leases starting at \$227/month



Turn the page to
find out more
about affordable
UmaxPC systems.

1-888-BUY-UMAX

Toll Free: 1-888-289-8629 Keycode #202

GET CREATIVE

UMAX®



UMAXPC.

AFFORDABLE NT GRAPHICS SYSTEMS FOR CREATIVES.

UmaxPC 2000

- Intel 200MHz Pentium processor with MMX™ technology
- 32MB EDO RAM/512KB Pipeline Burst Cache
- 3GB EIDE Hard Disk Drive
- 100MB Zip Drive, 3.5" Floppy Drive
- 24X ATAPI CD-ROM Drive
- S3 VIRGE 4MB DRAM Graphics Card
- 15" Flat Square Color Monitor (13.7" v.a.)
- 56Kbps Data & Fax Modem
- 10/100TX PCI Ethernet Card
- Creative Labs 3D Sound, Audio In/Out & Mic ports
- Amplified Stereo Speakers
- Mid-tower Case with 250W Power Supply
- EPP/ECP printer port, (2) 16550 serial ports, (2) USB ports
- PS/2 Keyboard & Microsoft IntelliMouse
- Windows NT Workstation (Windows 95 available)
- Adobe PhotoDeluxe, Adobe PageMill 2.0, Adobe Type Manager, Lotus SmartSuite

#P2000.....\$1895

Business leases starting at \$54/month

UmaxPC 2200

- Intel 200MHz Pentium processor with MMX
- 32MB EDO RAM/512KB Pipeline Burst Cache
- 4GB EIDE Hard Disk Drive
- 100MB Zip Drive, 3.5" Floppy Drive
- 24X ATAPI CD-ROM Drive
- Matrox Millenium 4MB WRAM Graphics Card
- 17" Flat Square Color Monitor (15.8" v.a.)
- 56Kbps Data & Fax Modem
- 10/100TX PCI Ethernet Card
- Creative Labs 3D Sound, Audio In/Out & Mic ports
- Amplified Stereo Speakers
- Mid-tower Case with 250W Power Supply
- EPP/ECP printer port, (2) 16550 serial ports, (2) USB ports
- PS/2 Keyboard & Microsoft IntelliMouse
- Windows NT Workstation (Windows 95 available)
- Adobe PhotoDeluxe, Adobe PageMill 2.0, Adobe Type Manager, Lotus SmartSuite

#P2200.....\$2195

Business leases starting at \$62/month

UmaxPC 2400

- Intel 200MHz Pentium processor with MMX
- 64MB EDO RAM/512KB Pipeline Burst Cache
- 5GB EIDE Hard Disk Drive
- 100MB Zip Drive, 3.5" Floppy Drive
- 24X ATAPI CD-ROM Drive
- Matrox Millenium 4MB WRAM Graphics Card
- 19" Multi-Step Dynamic Focus Color Monitor (18" v.a.)
- 56Kbps Data & Fax Modem
- 10/100TX PCI Ethernet Card
- Creative Labs 3D Sound, Audio In/Out & Mic ports
- Amplified Stereo Speakers
- Mid-tower Case with 250W Power Supply
- EPP/ECP printer port, (2) 16550 serial ports, (2) USB ports
- PS/2 Keyboard & Microsoft IntelliMouse
- Windows NT Workstation (Windows 95 available)
- Adobe PhotoDeluxe, Adobe PageMill 2.0, Adobe Type Manager, Lotus SmartSuite

#P2400.....\$2695

Business leases starting at \$76/month

Options for UmaxStation and UmaxPC systems:

- 15" Flat Square Color Monitor (13.7" v.a.)\$285
- 17" Flat Square Color Monitor (15.6" v.a.)\$485
- 19" Dynamic Focus Color Monitor (18" v.a.)\$985
- 21" DiamondTron Color Monitor (19.7" v.a.)\$1345
- 4x/6x Yamaha Recordable CD-ROM\$675
- Iomega® Jaz Drive\$345
- Adobe Premiere® 4.0\$495
- Adobe After Effects®\$645
- Iomega Ditto™ 3200 Tape Drive\$195
- Adaptec 2940UW SCSI Controller\$185
- Yamaha Stereo Speakers with Sub-Woofer\$115
- Three-Year Onsite Extended Warranty\$125

Ordering

To order, call 1-888-BUY-UMAX between 6 am and 6 pm Monday-Friday, and 9 am and 6 pm Saturday-Sunday (Pacific time). To configure your system online, visit our web site at www.umaxpc.com. We welcome payment by Visa, MasterCard, Discover, American Express, wire transfer, money order, or check. Check orders are held 5-10 days for clearing. Purchase Orders from major corporations, government offices, and educational institutions are gladly accepted.

Warranty

All UmaxPC and UmaxStation systems are backed by the Umax 30-day Moneyback Satisfaction Guarantee and are covered by a three-year limited warranty with one year of onsite service. For a complete copy of our guarantees, limited warranties, or service policies, please write to Umax Systems Sales, 3485 Kifer Road, Santa Clara, CA 95051, or visit our web site at www.umaxpc.com.

Shipping

Umax offers a variety of shipping services, ranging from UPS Groundtrack to Federal Express Priority Overnight. Please ask your salesperson for details regarding pricing and availability.

Technical Support

Technical support for UmaxPC and UmaxStation systems is available 24 hours a day, seven days a week. Additional technical support is provided by the publishers of software bundled with Umax systems. Complete information on technical support is included with each system.

Umax Technologies, Inc. is not responsible for omissions or errors in typography or photography. Prices and specifications valid in the U.S. only and subject to change without notice. All purchases are subject to availability, and are subject to Umax Technologies' current terms and conditions of sale. Prices do not include shipping and handling. 30-day money back guarantee policy does not include return freight and original shipping/handling charges, applies only to UmaxPC brand products, and begins on the date of shipment. Onsite service is provided by an independent third-party provider and may not be available in certain remote locations. The Intel Inside logo and Pentium are registered trademarks, and MMX is a trademark of Intel Corporation. MS, Microsoft, Windows, and Windows NT are registered trademarks of Microsoft Corporation. All other trademarks or registered trademarks are property of their respective companies. © 1997 Umax Technologies, Inc. All rights reserved.



Toll Free: 1-888-289-8629 Keycode #202

1-888-BUY-UMAX

CIRCLE 242 ON READER SERVICE CARD

www.umaxpc.com

Umax Systems Sales
3485 Kifer Road, Santa Clara, CA 95051-0711
408-617-0270 • Fax 408-735-0222

First Looks

WINDOWS UTILITIES

Universal Cut and Paste

Any97 provides an omnipresent link between Windows applications.—By Barry Simon

Anysoft's \$69 Any97 and \$129 Any97 Pro are powerful utilities that let you transfer data between applications quickly and easily. What places these programs above the functionality of the clipboard is their ability to work seamlessly with DOS windows and pull out block data from sources like Web pages.

Any97 has a floating palette of markers. You drag a marker to an application window and your cursor changes to let you select a data block. Once you've selected the data, it goes directly to the

target associated with that marker. Markers can be associated with multiple destinations and configured to send data as a table rather than straight text.

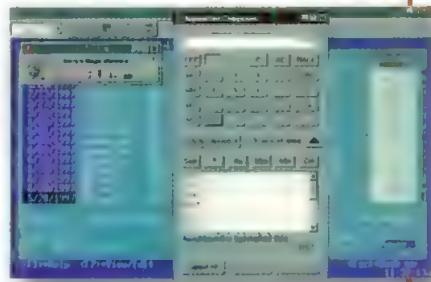
The Pro product includes extra tabs of markers that have Anysoft components as destinations. There is a calculator component as well as subcomponents for sums and other mathematical operations. Drag the sum component to a window with some numbers. Then select the numbers and their sum will pop up.

The Pro version also has com-

ponents for quick graphs, bitmap manipulations, and links to a rudimentary SMTP module that can send mail. You can configure a mail marker so that when you use it to mark something, the marked material is sent to a preaddressed mail message.

During installation, the program searches for OLE components certified by Anysoft (including major office-productivity software suites) and adds the appropriate markers. If you have Excel, Any97 will install markers that can send text to a worksheet and an Excel chart.

This is a handy program to have, and heavy users will regard it as a big time-saver.



MARK IT UP: You can use Any97 to mark a column of data in DOS and add it up.

Any97, Version 1.0. List price: \$129 (Pro), \$69 (Regular). Requires: Microsoft Windows 95 or Windows 3.1, 4MB of RAM (8MB recommended), 10MB disk space, CD-ROM drive. Anysoft, Cambridge, MA: 888-269-7638, 617-868-3397; www.anysoft.com. Circle 401 on reader service card.

BOOKS

Office 97 Between the Covers

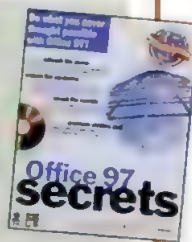
You'll need a collection of books to learn everything about Microsoft Office 97.—By Edward Mendelson

Microsoft, like most other software vendors, claims that users don't want traditional office manuals. Unfortunately, Office 97 is probably the most complex software package ever written, and anyone who wants to use it as something other than a notepad and calculator will need a detailed roadmap to its multitude of features.

Here we reviewed four encyclopedic guides to the complete Office 97 package. Each has a different emphasis and is addressed to a different level of expertise. But if these gigantic books aren't enough, you can find even more detailed guides (from the same publishers) that cover Word, Excel, PowerPoint, Access, and Outlook. Unlike Clippy, the Office Assistant that answers your questions when you use Office, none of these books distract you with animated icons.

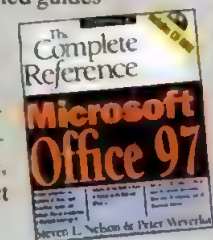


■ Hundreds of tips, cautions, and explanations combine with dozens of useful macros to make **Office 97 Secrets** (\$49.99) a treasure trove for advanced users. In 820 pages of no-nonsense prose, Steve Cummings and Robert Cowart describe Office 97's most complex formatting, automation, Internet, and data-analysis features. Even subtleties like the different behavior of the Office spell-checker in Word, Excel, and PowerPoint are addressed. A detailed introduction to Visual Basic for Applications lets nonprogrammers write advanced macros complete with custom dialog boxes. Macros included in the text and on an accompanying CD-ROM add conveniences that should have been built into Office itself. Any book can teach you how to use Office. This one shows you how to make it sing. (www.idgbooks.com; ISBN: 0-7645-3015-1.)



■ Starting with the basics of the Windows interface and ending with elementary macro programming, **Mastering Microsoft Office 97 Professional Edition** (\$39.99) is organized like a training course. Lonnie E. Moseley and David M. Brodey's 1,130-page survey of Office 97 emphasizes tasks you'll want to perform as well as tips and tricks that make these tasks easier. Instead of listing encyclopedic details (like the codes used in searching for paragraph marks and other nonprinting characters), it refers you to Office's help files. A brief survey of Internet features understates the problems you may face when converting Office documents for the Web, but it offers enough detail to get you started. This is an ideal book for beginners and intermediate users, but experts should look elsewhere. (www.sybex.com; ISBN: 0-7821-1925-5.)

■ There's too much in Office 97 for one or two authors to explore in depth, so Rick and Patty Winter worked with nine additional coauthors to produce **Using Microsoft Office 97 Professional Special Edition** (\$39.99). Step-by-step instructions and meticulous descriptions of toolbar buttons and other screen elements make this a book for anyone who wants to learn Office in depth. Dozens of trouble-shooting tips help solve common problems. But even with 1,180 pages, the book skimps on Word's fields and Excel's functions, and it gives only an overview of Outlook. Still, it's worth buying for its thorough treatment of keyboard shortcuts, which make Office far more efficient than it seems when you rely only on the mouse. (www.mcp.com/que; ISBN: 0-7897-0896-5.)



■ On the CD-ROM that comes with Stephen L. Nelson and Peter Weverka's **The Complete Reference: Microsoft Office 97** (\$39.99), you'll find over 200 sample files that are useful for experimenting with the basic and intermediate techniques covered in this 940-page book. The book's step-by-step instructions guide you through the commonly used features in Office 97, with exceptionally detailed coverage of Access. Expert features like fields, macros, and VBA programming are beyond the scope of the book, but every other feature is described in depth—along with useful tips and warnings. The authors mistakenly believe that you can't enter accented characters in Word's Find and Replace dialog box, so they offer a full page of unnecessary workarounds. Other than this, the basic level of accuracy is high. (www.osborne.com; ISBN: 0-07-882338-2.)



**A line of desktops that will change the way
(Not to mention the companies that**



They're on every desk in your office. They're one of the largest computer investments your company can make.

Yes, choosing a desktop is a major decision. Companies are looking deeper than specs for real business solutions. Do they have the technology you need? Are they flexible enough to change and grow as your company does? Can you manage them easily and cost effectively?

At Compaq, we understand your need for answers. It's reflected in every feature and innovation we've designed into the newest Compaq Deskpro line.

Inside the Deskpro 2000, 4000 and 6000 series you'll find the type of innovative thinking that's made Compaq the industry leader in desktops. Useful innovation that will satisfy your changing needs. Technology configured to allow your end users to do more faster. Improved Intelligent Manageability for even greater control over your desktops from a single location. New aggressive pricing, the most aggressive Compaq has ever offered. And an incredibly low cost of ownership.

The new Deskpro line. They're unlike any other desktops on the market. Because we believe innovation should extend far beyond a spec box. Don't you?

For more information about the Deskpro series and the reseller nearest you, visit us at www.compaq.com/products/desktops, or call 1-800-345-1518.

**you look at desktops.
make them.)**

COMPAQ

© 1997 Compaq International, Inc.

First Looks

PROJECT MANAGEMENT SOFTWARE

Professional Projects

SureTrak 2.0 will help you keep your projects on target, but it's not for novices.—By Brian Proffit

If you're working on complex projects in complex environments, Primavera Systems' \$400 SureTrak Project Manager 2.0 may just be the product you need. A wealth of functions makes it a professional product, but beginners may find it too difficult to master.

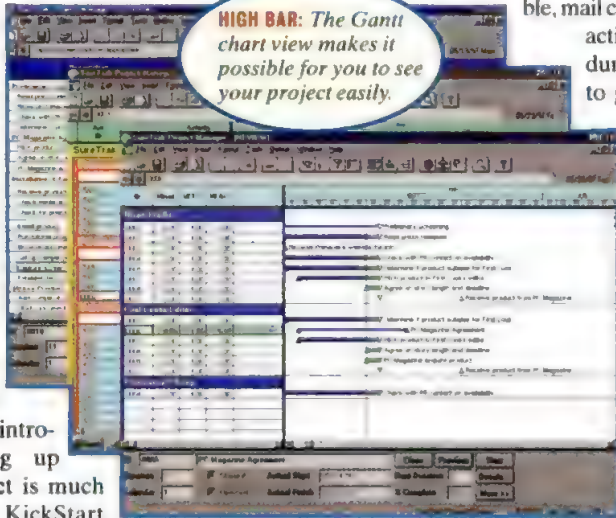
Installation is straightforward, and the animated tutorial provides a good (though limited) introduction. Setting up your first project is much easier with the KickStart wizard, which walks you through all the phases of your project as well as the activities that make up each phase. Afterwards, you list the project's goals along with its expected participants.

We were impressed with the next step: KickStart asks you to imagine a meeting with project personnel. For each person, you consider whether he or she might suggest additional activities that should be tracked. You then list any potential obstacles that could stand in the way of the project, and you decide which additional activities are needed to minimize or avoid them. Finally, you assign people to each activity in the project.

Once the project has been created by the wizard, you define the duration of each activity and establish the relationships between activities. Unfortunately, the wizard doesn't prompt you for periods when activities are created, which necessitates this extra

step. Relationships between activities are easily established by clicking and dragging from

HIGH BAR: The Gantt chart view makes it possible for you to see your project easily.



the end of one activity to the beginning of another.

It's possible to establish target dates for comparison with actual results. You can apply constraints, such as whether a project has been completed early or late, or mandatory start and finish dates. You can also define multiple calendars. Meetings are automatically scheduled when all personnel are available. For instance, if John is scheduled to have Thursday off and Sheila is scheduled to have Friday off, meetings that they both must attend cannot take place on either day.

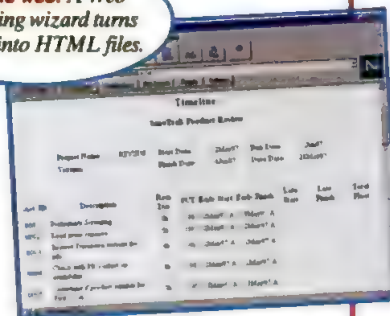
ORGANIZING ACTIVITIES

Activities can be organized in many ways. You can use activity IDs to create a structure. This can be done in outline format or as a Work Breakdown Struc-

ture (WBS). WBS codes are like outlines, but they allow you to use alphabetic codes to provide more meaning. These hierarchical formats let you collapse or expand levels to expose the amount of detail you want to see.

You can organize activities by department, person responsible, mail code, subproject ID, activity type, or actual duration. In addition to grouping activities within a project, SureTrak allows you to group projects together. This provides upper management with a great tool for getting the big picture on overall company status and resource usage.

WORK THE WEB: A Web Publishing wizard turns reports into HTML files.



Still, the sheer volume of activities in a large project can lead to confusion. Fortunately, you can apply filters that let you view the information you're most interested in.

The PERT view makes it easier to see relationships between activities. The split-pane Trace Logic view makes it easy to see the predecessors and successors of a selected activity.

There are also excellent charting tools for tracking resources. In addition to tracking accrued costs by resource, SureTrak lets you track revenue earned by resource, a unique addition.

SureTrak has built-in network, e-mail, and Internet/intranet capabilities. Through the included Primavera Post Office, SureTrak allows team members to generate updates to their activities and mail these updates back—even if they don't use SureTrak. With the Web Publishing wizard, it's easy to turn projects and reports into well-formatted HTML files.

SureTrak has more extras than we have space to list here. Once you're comfortable using it, you'll love it—but this may take some time.

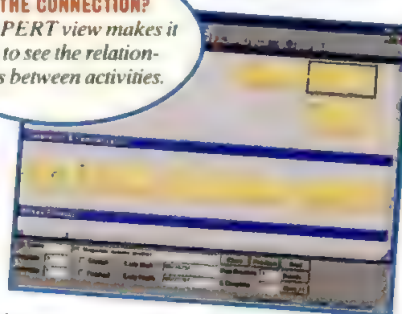
SureTrak Project Manager 2.0. Street price: \$400; upgrade, \$129. Requires: 486/66 or better, 8MB RAM (16MB recommended), 38MB hard disk space, OS/2 3.0 or higher, Microsoft Windows 3.1 or higher, Windows NT 3.51 or higher. Primavera Systems Inc., Bala Cynwyd, PA; 800-423-0245, 610-667-8600; www.primavera.com. Circle 405 on reader service card.

TRACKING YOUR PROJECT

The best way to look at your project is with the Gantt chart, which SureTrak dresses up into a highly customizable bar chart. In addition to organizing activities by any of the groupings already described, you can sort them based on several criteria.

Sorting by total float will pop the most

GET THE CONNECTION? The PERT view makes it easy to see the relationships between activities.



critical activities up to the top automatically. Additionally, you can insert graphics and OLE objects into the view. Customized views can be stored as layouts, so you can reload them to switch between favorite appearances.

**MMIX™ TECHNOLOGY,
12.1" ACTIVE MATRIX,
40MB RAM, 2GB HDD,
33.6 FAX/MODEM**



\$2999

CALL NOW! LIMITED TIME OFFER.

- **128-Bit Graphics Accelerator**
- Intel® Pentium® Processor with MMX™ Technology, 150MHz, Running at 2.5V
- 16-Bit Soundblaster Pro-compatible Stereo Audio
- 45-Watt Lithium Ion Smart Battery
- Parallel, Serial, VGA, and PS/2 Port
- Integrated dual-button touchpad
- Full one-year extendable warranty
- Microsoft Windows® 95 installed

\$2999 Add a port replicator for only \$99

[illegible]

- Intel® Pentium® Processor with MMX™ Technology, 166MHz, Running at 2.5V
- 12.1" SVGA Active Matrix Screen
- 32MB EDO DRAM
- 2GB removable Hard Drive
- 33.6 Internal Fax/Data Modem
- 59-Watt Lithium Ion Smart Battery

WinBook
COMPUTER CORPORATION

1-800-293-1636

CALL FOR OTHER PEOPLE'S REVIEWS

Mon-Fri 8am-9pm EST • Sat 9am-4pm EST
U.S. sales only. 30-day unconditional money-back guarantee from date of purchase.

©1997 Intel® Corporation. All rights reserved. Pentium® is a registered trademark of Intel Corporation or its subsidiaries. Pentium Pro® is a registered trademark of Intel Corporation or its subsidiaries. Pentium® and Pentium Pro® are registered trademarks of Intel Corporation. All other trademarks and registered trademarks are the property of their respective owners. All prices and specifications are subject to change without notice or obligation. Prices do not include shipping.



CIRCLE 085 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink



"Gee, Frank.

*Maybe you should take
the rest of the day off."*

Sanity — wrapped up nicely in a cardboard box.

Reduce irritating questions by 47%.

Spend more quality time configuring hardware.

Play QUAKE—without the annoying interruptions.

Microsoft® Exchange Server is designed to make your life easier in two basic ways.

First, Exchange delivers all the stuff your end users tend to clamor for—e-mail and scheduling and discussion groups and task lists and Internet capabilities. And, thanks to its elite team of mail routers and file savers, their messages always get delivered. Happy users are quiet users.

Second, Exchange Server is remarkably flexible and easy to administer. It supports all current Internet standards and protocols and it works with all major network environments. Centralized administration lets you configure Internet gateways, add and delete users, track messages and even reboot—using one friendly interface on a single machine. Automated Exchange System Attendants even watch over your server and connection status, responding to problems by restarting the server or notifying you—before you get the bothersome phone calls. Plus, Exchange's tight integration with Windows NT® Server lets you reap the benefits of advanced security features and helpful management tools like the performance monitor and event log.

Exchange Server is just one of the integrated Microsoft BackOffice® server products that can be customized to solve tons of your frustrating business problems. To learn more about Microsoft Exchange Server, and to get a free evaluation copy, please visit our Web site.

Loyal. Dependable. Dedicated.

Multi-Tech's K56flex client modems do everything you ask of them. Even fetch the paper.*

Loyal to our customers for over 26 years.

Multi-Tech's Client Communications products are recognized worldwide for their superior technology and reliable performance and are based on K56flex chips from Lucent Technologies Microelectronics Group. They help you quickly and easily share information across town or around the globe.



Dependable world-class communications for the work-a-day world.

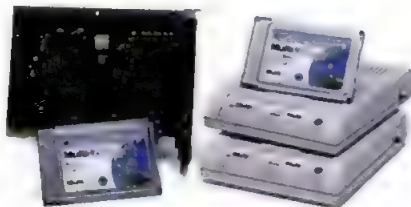
Our line of desktop, internal and portable modems gives you every possible communications option, including high-performance modems, some with sophisticated voice mail and desktop video conferencing capabilities, ISDN modems that let

you communicate at blazing speed, and modems that feature our patented digital simultaneous voice and data (DSVD) technology. Multi-Tech has the right answer for your corporate, small office or personal communications needs.

Dedicated to providing the world with the best communications tools. With distribution in more than 80 countries, no other modem is so recognized around the world! In addition to our modems, Multi-Tech also provides broad-based connectivity solutions, including ISP and intranet servers, LAN access solutions, multi-user access products and WAN products.

Call us. We're eager to provide solutions.

For information on Multi-Tech's Client Communications modems or any of our products, call us at (888) 288-4313 or contact us on the Internet at <http://www.multitech.com>



*You can even read newspapers online!

Multi-Tech Systems, Inc.
2205 Woodside Drive / Mounds View, Minnesota 55112, U.S.A.
Tel: (612) 785-3500 / Fax: (612) 785-9874 / BBS: (612) 785-3702
www.multitech.com

Copyright © 1997 by Multi-Tech Systems, Inc.
All rights reserved.
Trademarks: Multi-Tech and the Multi-Tech logo
Multi-Tech Systems, Inc. / K56flex: Lucent Technologies
and Realworld International



MultiTech Systems
The right answer every time.

CIRCLE 179 ON READER SERVICE CARD

Second Looks

TEKTRONIX PHASER 450

Speedier Prints

Tektronix's \$6,995 Phaser 450 is a sophisticated dye-sublimation printer that reflects a maturing technology. It combines a small footprint, first-rate color management, superb documentation, virtual jam-free operation, and versatile media. But the bottom line is its excellent print quality. Colors are bright, accurate, and realistically saturated. Details are sharp and well-defined, even in highlights and shadows. In addition, it's the first Tektronix product to offer Color-Seal, a heat-embossed overlay designed to protect prints from color-leeching UV rays, fingerprints, and spills.

The Phaser 450 is also fast. Once an image file is rasterized and downloaded, it takes roughly a minute and a half to output a three-color letter-size print and about two minutes to output a four-color letter-size print. That makes it approximately 20 percent faster than older Phaser dye-sub models. But unless you use a dedicated high-speed server or a hardware ripper (which can you cost two to four times as much as the printer), rasterizing images can take many minutes or even hours, depending on file size and complexity. Adobe provides a Photoshop plug-in that outputs about 5 percent faster than the Windows print driver, but rasterizing is still a major bottleneck.

To boost performance times on all its Phaser printers, Tektronix is now offering a Photoshop plug-in that bypasses the Windows print driver (available from the Tektronix Web site at www.tek.com/

[Color_Printers/](#)). Instead of using the Print command, users can click on Export and then PhaserPrint. Unlike the printer driver, the export plug-in lets you select the output port (TCP/IP, PostScript File, printer driver, or local port), compress image data, and display a color preview. It also has options for scale-to-fit, fast preview, and color-strip control.

We timed how long it took to output three different image



IT'S IN THE MAIL:

Tektronix will send you e-mail when there's a new driver to be had.

files on our Micron Millennium test machine (a 150-MHz Pentium with 64MB

RAM). We first used the standard Print command and then switched to the PhaserPrint mode. Our 12.7MB test image took 22:59 using the Print command but only 9:57 with PhaserPrint. Similarly, a 19.9MB image took 35:18 using

the Print command but only 16:20 with PhaserPrint. Incidentally, these two drivers are completely separate and must be configured individually. For instance, you can set Vivid Image mode in the Windows driver, but you must set the PhaserPrint driver to Photo mode.

Although we output via the parallel port only, Tektronix claims that PhaserPrint works equally well with Ethernet. PhaserPrint can be used only with Photoshop, and the company has not announced whether it will be available for use with any other graphics program.—Daniel Grotta and Sally Wiener Grotta

MICROSOFT WORD 97

Get the Word Out

Tired of saving Microsoft Word 97 files as Word 95 files, only to find out that they really get saved as RTF files instead of .DOC files? Microsoft Office 97 users finally have a solution that bridges the file-format gap between Microsoft Word 97 and Word 95.

Microsoft now offers the Word 6.0/95 Binary Converter for Word 97 as a free down-

load from its Web site (www.microsoft.com). The Converter saves Word 97 documents as binary files with a .DOC extension, eliminating the annoying RTF issue. Upon installation, the add-on automatically replaces the original Word 6.0/95 converter that first shipped with Word 97. Also available is the Microsoft Word 97 Document Converter, which lets you view a Word 97 document in Word for Windows 6.0 or Word 7.0 for Windows 95.

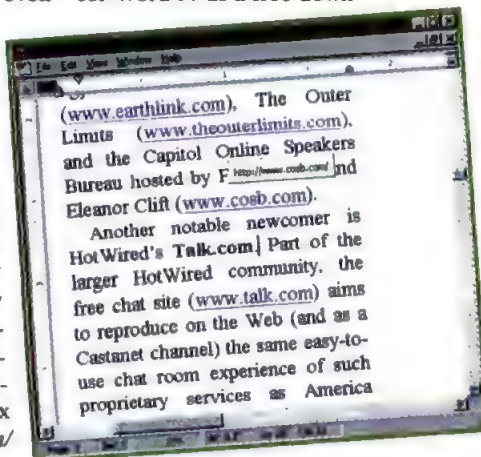
If you want to be able to view a Word 97 file only, then download the standalone Microsoft Word Viewer 97. This program displays and prints Word documents in their native format, retaining page layouts, annotations, and other Word-specific attrib-

utes. The viewer, which can be configured as a helper application for Netscape Navigator or Microsoft Internet Explorer, also allows you to launch hyperlinks within Word documents directly. A similar viewer is available for Excel 97 files.

Inso, which produces Quick View Plus 4.0 for Windows 95, Windows NT 4.0, and Windows 3.1, now has an update available that supports both Word 97 and Excel 97. The viewers (downloadable from Inso's Web site at www.inso.com) work only with the \$60 Quick View Plus 4.0; owners of previous Quick View versions will need to upgrade for \$30 in order to utilize the viewers.

The viewers support most but not all Word and Excel features. Word Art graphics, AutoShape graphics, and objects created using Word 97 drawing tools cannot be displayed; instead, they are represented by a gray placeholder box.—Melissa J. Perenson

SECOND LOOKS MAILBOX: Tell Second Looks about your experiences with computer products. Contact Carol Venezia at cvenezia@zd.com.





Announcing the first desktop computer
that's not a desktop computer.

©1997 Hitachi PC Corporation (USA). All rights reserved. "Hitachi VisionFlow Pro" and "Mobilized Computing" are trademarks of Hitachi PC Corporation (USA), which may be registered in some jurisdictions. The Intel Inside Logo & Pentium® are registered trademarks and MMX is a trademark of Intel Corporation. All other marks are owned by their respective companies. *All x2 products are capable of 56Kbps downloads; however, due to FCC regulations which restrict power output, current download speeds are limited to 63Kbps. *Concurrent use of floppy and CD-ROM drives requires use of external AC adapter. Model shown is 7560 and specs quoted apply to that model. Specifications and availability subject to change without notice.

Introducing
THE HITACHI VISIONBOOK PRO.
BUSINESS-SPEED MODEM, BUILT-IN LAN, HUGE SCREEN.

Once there were very good reasons to have one kind of computer for running your business and another kind for running around. But, with the introduction of the Hitachi VisionBook Pro,[™] those reasons abruptly disappear. Because of our unique technology, the gap between desktop PCs and notebook PCs is, in practical terms, totally obliterated. By every measure—screen clarity and viewing area, concurrent use of floppy and CD ROM drives,^{*} the performance of Intel's Pentium[®] processor with MMX[™] technology—you compromise nothing.

And the new Hitachi VisionBook Pro delivers integrated communication features previously known only to desktops. With Fax/Modem and LAN, you're ready to

influence events from wherever you do business. The Hitachi VisionBook Pro

It will give you
your desk back

While eliminating
your need for one.



I'll be working out of the office today.

SIGNIFICANT FEATURES

- US Robotics[®] 56K[™] x2[™] modem—fastest in a notebook
- Integrated IOBaseT LAN port
- Hitachi super large 13.3" TFT display
- XGA (1024 x 768) resolution
- 166MHz Intel Pentium[®] processor with MMX[™] technology
- 512K L2 cache—twice standard size
- Card Bus-compliant Type II/III PC card slots supporting Zoom Video
- 32MB EDO RAM upgradeable to 144MB
- 3.0GB removable hard drive
- Smart Lithium-Ion battery swaps with 3.5" floppy drive
- 10x CD ROM drive swaps with second battery
- Optional advanced port replicator
- Full-size keyboard USB port



Call 1-800-HITACHI

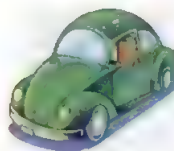
www.HitachiPC.com

PCM 0909

Things that are
easy.



Things that are
inexpensive.



Things you can
trust.



Let's face it...if the product you're looking for is easy to use, affordable, and reliable, there's a very good chance you'll buy it.

That's why we at NETGEAR™ have one simple goal: to take the work out of networking. We do that by providing products that are easy to install, surprisingly inexpensive, and trustworthy.



- Ethernet Hubs (4, 8, or 16-port)
- Switches (10/100Mbps, 2 or 7-port)
- Fast Ethernet Hubs (8 or 16-port)
- ISDN Internet Routers

You'll find these qualities in everything we make—from our Ethernet hubs to switches to ISDN products. Each of them has been designed to complement the way you work, the way your company is connected, and the way your company will grow. And the best part is that they're backed by Bay Networks, an industry leader in networking for more than a decade.

So if you're looking for the right networking gear, there's really only one company you should connect with. NETGEAR. Networking simplified.

1-888-NETGEAR

<http://NETGEAR.baynetworks.com/home>

For reseller information, please call
Ingram Micro at 1-800-456-8000.

COMPUSA

For the store nearest you call 1-800-266-7872

NETGEAR™

A Bay Networks Company



Bay Networks

©1996 NETGEAR. Volkswagen USA, Inc. is not affiliated with and does not endorse NETGEAR. NETGEAR is a trademark of Bay Networks, Inc. All rights reserved.

CIRCLE 266 ON READER SERVICE CARD

The Marketers Have Gone Mad

I know nothing about marketing. I learned this for the first time back in early 1970s, when I told an advertising guy who worked on the Wisk laundry detergent account that I would never buy a container of Wisk because of the obnoxious "ring around the collar"

commercials. (In case you're too young to remember, the ads featured housewives discovering their woeful inadequacy in the form of dirt rings on the shirt collars in their laundry, accompanied by a taunting singsong, "ring around the collar!") With a smug sneer that still rankles, he told me that it was one of the most successful advertising campaigns ever, and that I didn't know what I was talking about. Be that as it may, we have never bought a bottle of Wisk. And I still won't buy Charmin because of Mr. Whipple.

I've been reminded again and again over the years of my cluelessness about marketing as I see products succeeding despite ad campaigns that are too painful to watch. Madison Avenue's latest victim is Nissan. Yeah, the old guy and the dog are cute, but should I buy his product because dogs ostensibly love trucks? It's sad to see a company with fine products that has absolutely no idea how to tell its customers about them.

Further proof of my cluelessness is bountifully evident in the high-tech world. Advertisers have taken just about every wrong turn imaginable, from rampant sexism to puerile bullying, from gratuitous slams at the competition to ridiculous overpromising. Some of the products have done well, some not. The ads, however, remain an embarrassment, a smirch on an industry that seems to spend too much time in a slightly skewed universe, nearly parallel with the mainstream but just a bit out of synch. Inexperience and small budgets can excuse a lot, but if that's the case, what excuse does Microsoft have for some of its forays?

Maybe the "Where do you want to go today?" campaign resonates with you, maybe not. I agree with the guy in the Lotus rejoinder ad, who just wanted to go home at the end of a busy day. But it's a gentle enough, inoffensive message. On the other end of the spectrum is Microsoft's ActiveX campaign, aimed at developers. This one features young Generation-X developers in improbable scenarios, making outrageous claims for ActiveX. One Doc Martens—shod guru sits atop an oil drum in a seeming inferno, with other drums blazing around him. "With ActiveX I can make you

feel at home in Hell's Kitchen," reads the stenciled lettering on a barrel. The next asks, "What can you do?"

I can turn the page, that's what I can do. Especially after I read the copy, which exhorts me to build my own VRML controls and online business transaction apps from scratch with ActiveX. This is better than using a packaged VRML toolkit? Is creating a unique user interface that works at just one site a new form of productivity?

Another ActiveX ad places a developer waist-deep in Corn Pops. His T-shirt reads, "With ActiveX I can harvest Corn Pops, wing nuts and Detroit steel." And it asks the inevitable, "What can you do?" Gee, that's a lot to ask of a gussied-up OLE control, isn't it?

I continue to marvel at how this guy managed to keep a straight face while they photographed him awash in a sea of Corn Pops. Oh, gosh, wait! Could it possibly have been a trick of digital imaging? Not only are they overclaiming the seemingly limitless powers of ActiveX, but manipulating the very image that's supposed to make me a believer? I'm devastated.

My favorite is one of Microsoft's newest TV spots for Internet Explorer. Tantalizing images flash before your eyes, far too fast for anything but a cable modem or your very own T-1 line. Music swells in the background. The images become more insistent, the chorus of voices becomes clearer. The Latin phrases create an aura of hallowed authority, leading you into a transcendent world, a

higher plane of knowledge. The screen fills with the portentous phrase, "Where do you want to go today?"

The music is from Mozart's Requiem, and they're singing "*Confutatis maledictis, flammis acerbis addictis*," which translates to "When the damned shall be cast down into the searing flames" (translation at garnet.acns.fsu.edu/~jnk5842/court/smite.html). It kind of makes you wonder whom they're singing about—Microsoft's customers? Their competitors? The beta testers for Internet Explorer 4.0? Or maybe they're singing about the fate of Web-based pornographers now that the Supreme Court has struck down the Communications Decency Act. □



OBNOXIOUS ADS
Advertisers take every wrong turn imaginable, from rampant sexism to puerile bullying.

Rock & Roll isn't dead.

It's just **asleep**
in your garage.

Easy CD Creator
turns your scratchy
old LPs into
crystal clear CDs.

They don't make music like they used to, which is why we're introducing Easy CD Creator™ Deluxe Edition software. Now you can enjoy the power to clean up your old recordings and record your own personal CD master discs. It's simple with features that let you professionally digitize your music with any of today's CD burners. Easy CD Creator removes pops and scratches to uncover stunning clarity. Then immortalize it on a CD master disc or burn it to a CD-R disc. Or back up your hard drive and store important files. It's easy with Easy CD Creator Deluxe Edition. Once you've tried it, you'll never want to go back to the old way of recording records. Because they don't make music like they used to.

Visit our Web site at www.adaptec.com/easycd/pcm

MSRP Only \$99
Call 1-800-442-7274 ext. 2163.



 **adaptec**™ www.adaptec.com

© 1997 Adaptec, Inc. All rights reserved. Adaptec, the Adaptec logo and tag line, and Easy CD Creator software are trademarks of Adaptec, Inc., which may be registered in some jurisdictions. Our software is designed to assist you in reproducing material in which you own the copyright or have permission to copy from the copyright owner. *Suggested retail price U.S. dollars, subject to change without notice.

NBC: The New Bill Channel?

Simmering under the surface of today's high-technology news are juicy tidbits that lead me to believe Bill Gates will become a media mogul. This will happen when Gates buys a major TV network and turns Microsoft over to Steve Ballmer. There is evidence to support this.

Bill has always fancied himself a powerful person, but without the trappings; he doesn't act quite like a mogul. To get the trappings he's decided to make some interesting alliances. The most extreme is with a current media magnate—Australia's richest man, Kerry Packer, whose Nine Network is the largest television network in Australia. (Packer also owns ACP—a publisher whose titles include *Cosmopolitan* and *Woman's Day*.) He is much like Gates, an iconoclastic and take-no-prisoners kind of guy. He's also an enemy of Rupert Murdoch, who I believe will eventually butt heads with Gates.

According to Reuters, Microsoft and Packer's Publishing and Broadcasting Ltd. (PBL) have formed a joint venture to provide online news, sports, entertainment, and weather programs as well as financial and retail services. An online service that will incorporate Expedia, MSN, Sidewalk, and other entities will augment the venture.

This play in Australia is just a practice round for Bill's bigger move: the eventual purchase of NBC. A number of rumors are circulating in the industry regarding Gates's meetings with General Electric, and these meetings are not about GE adopting Windows NT; insiders say that they're about Gates's buying NBC (which GE owns). In fact, he initiated MSNBC so he could see how well he liked the business and so he could have a possible front for the big play—buying the whole shebang. Since starting MSNBC, Gates has bought WebTV and a billion-dollar share of Comcast, and now all he needs to put himself into the big leagues with the major players is a content factory such as NBC. Needless to say, the recent report of Gates's interest in CBS was clearly a ruse.

To get the public ready to accept the "new" Bill Gates, a number of interesting puff pieces have been carefully placed in major media. All were designed to boost his image. First was another *Fortune* cover photo along with a brain-dead article. Then came "In Search of the Real Bill Gates," a fawning and almost pathetic promotional article in *Time*.

Following this was an even softer (and longer) *Newsweek* piece entitled "How We Did It" with Gates and Ballmer (available on AOL; the keyword is *Newsweek*) that may as well have been written by Waggener-Edstrom, Microsoft's PR agency. Although this could be an effort to get Bill the

Nobel Peace Prize, I see it as an exit strategy for him. Exit from Microsoft, that is. The reason I suggest this is because of that interview. It's the first time I've ever seen a piece so carefully crafted to create the notion that Microsoft will do just fine with Ballmer at the helm.

This joint Gates/Ballmer interview seemed especially unusual because Ballmer has been on Microsoft's sidelines for a while. The article constantly commented on how important Ballmer is to the company and how he's more responsible for Microsoft's success than people think. The duo answered a "What if something happened to Bill?" question by saying that Ballmer would ascend the throne and not much would change.

Since Bill is not on a book tour or selling anything new, these gratuitous staged interviews in major magazines have to serve some other purpose. In the *Newsweek* interview, Gates and Ballmer both moaned about Gates's time constraints, but if he's been so busy, how did he have time for this time-wasting interview? Obviously it was part of a long-term public-relations scheme to soften the blow of Gates's announcing new roles for himself and Ballmer.

It was just a matter of time before Gates discovered that owning the media is the absolute best way of controlling them. In our system of free speech and free press, it's useful for large corporations simply to own the main channels of information distribution outright. GE, Disney (ABC), and Westinghouse (CBS) are perfect examples.

When Microsoft recently announced its desire to cut back on the business's ISP aspect and concentrate on content, with entities such as a new MSN and Sidewalk, we accepted the change. We can expect more weird announcements and alliances over the months ahead. Now you know why. Gates is about to make his big move.



EXIT, STAGE RIGHT
Gates is learning
that owning the
media is
the best way
of controlling
them.

ake Roo

Disk space a problem? Too many disk drives? Here's the solution. Make Room. 120MB of room. Introducing SuperDisk™ and the LS-120 drive. Unlike the Zip™ drive, the LS-120 drive is compatible with standard 3.5" disks. So you only need one drive. In other words, don't buy a PC without it. To learn more about the SuperDisk™ diskette and other LS-120 solutions for notebook, desktop, and add-on drives, call 1-800-888-1889, ext. 4050 or visit www.imation.com.

Zip is a trademark of Imation Corp. SuperDisk, Circle pyramid logo, Imation and the Imation logo are trademarks of Imation Corp. © Imation 1997



IMATION
Borne of **3M** Innovation

Inside Track

As the MMX chip becomes the **de facto standard**, nearly every video-card maker has moved into the next generation of display—emphasizing 3-D in ways unachievable by MMX. The importance of MMX is already moot.

In fact, **MMX began as an idea at Intel** to add miscellaneous and undocumented instructions to the Pentium chip set for the sole purpose of confusing the heck out of AMD, Cyrix, and anyone else who tried to clone the Pentium. The original name was “**secret sauce**,” and Intel amused itself at the prospect of pulling this stunt. Then an engineer decided that it might be practical to make these instructions useful, thereby forcing AMD and Cyrix to create their own instructions.

Then two things happened. First, Nexgen had developed some important patents that would **roadblock Intel** if there weren't a cross-license. Second, Bill Gates said that Microsoft would not support any of the MMX instruction sets if they weren't consolidated. So Intel granted licenses for MMX and has yet to thwart its enemies completely.

Underreported Stories Dept.: There seem to be a lot of interesting stories coming from overseas that involve both **Microsoft and balance of trade**. Microsoft seems to be taking its profits and moving money abroad with abandon. Over the summer two such **odd deals** caught my attention. The first is Microsoft's plan to put a **multimillion-dollar research facility in Cambridge, England**. One report said that Microsoft was targeting Cambridge because it was home to the “biggest brains in the world.” This should go over big in Oxford and especially Manchester, where most of the interesting software in England is made. My guess is that Bill just wants to **have Stephen Hawking's e-mail address** in case he gets bored and wants to chat about the latest math or physics theory. Hawking is supposed to be behind the negotiations.

Oh, yes—the reason for this facility is that Gates hopes to spearhead a **new computer architecture**. I'm sure Andy Grove will roll his eyes when he gets word of this.

Microsoft also seems to be trying to get into the phone business. **Over the summer** Microsoft made a deal with the Dutch telecom PTT Telecom (creative name, huh?) to provide intranet and extranet services. The long-term goal is to run the entire phone net with Windows NT. Microsoft wants to **prove that Win NT can handle telco-level network loads**. With new offerings such as Signaling System 7 software, and other access and support software, Microsoft hopes to capture some telco business. Frankly, this

Was I the only one surprised to hear that the IT industry is pushing for a Web-site rating system? It's Vice President Gore's idea, and nobody wants to say “This is dumb, man! There are too many sites and it's moving too fast! Get a clue, dude!”

baffles me. First of all, as good as Win NT appears to be, I'm not sure I want a phone company switching to it to run its network. And heck, Microsoft has never gotten DOS—a **bloated** file loader posing as an OS—to work bug-free. Now this? Let's not forget so quickly that **Microsoft's own mega-Web site was seriously infected by a Win NT bug** this summer. If I find out that Microsoft is selling fly-by-wire software to Airbus Industries or Boeing, then I'm going back to rail travel.

It's as if these guys are just trying anything.

More Secret Stuff Dept.: Was I the only one surprised to hear that most of the IT industry is **secretly pushing for a Web-site rating system**? It began

about six months ago with Vice President Gore wandering around Silicon Valley with the likes of Jerry Yang, Marc Andreessen, and Kim Polese discussing the horrible potential of the Web as a disseminator of **pornography**. You'll recall that **Gore's wife**, Tipper, was largely responsible for promoting the rating system for audio recordings. (Man, has that had an impact or what? NOT!) So good ol' Al had to one-up wifey and get this ball rolling. This one will mirror the system used in the **movie industry**. Let's see—with a current estimate of 180,000,000 Web pages, this should be easy. And Web pages are constantly changing. Makes it even easier, doesn't it? And they are all over the world. **Piece o' cake, right?** The fact that this is still being discussed indicates to me that there is no discussion. It's Gore's idea and nobody wants to say, “This is dumb, man! There are too many sites and it's moving too fast! Get a clue, dude!” Needless to say, I'm never invited to these meetings.

The way to deal with porn-oriented and other unsavory sites is to redesign the Web so that all X-rated sites are on another system, or subsystem, or simply a different addressing scheme, such as **xxx.porn.com** rather than **www.porn.com**. **Pornographers would voluntarily** put themselves on the alternative system or face fines. Most pornographers would rather protect themselves from parental complaints than anything else. This **brain-dead and stupid rating system** idea is unworkable.

Mea Culpa Dept.: In my July Inside Track I had said that Taiwanese designers were considering new innovations in laptop design, including adding an “SVGA output port.” When I read this, I freaked as I thought my reliable copy editors had changed the text. It was supposed to read “S-Video port,” which is a heck of a lot more interesting than adding something we already have! I checked the unedited column, and indeed I had typed in the wrong wording myself. It went through as written. Duh. □

Satisfy
the thirst
for more
bandwidth.



Faster Simpler

NetScout

©1997 NetScout Systems, Inc.

Your network is thirsty for more bandwidth and Intel has the networking products you need for the move to Fast Ethernet. Our family of hubs, switches, routers, adapters and print servers is today's flexible solution that gives you more bandwidth when you need it. Plus, with our advancements in silicon technology, we can offer our 10/100Mbps products at prices comparable to 10Mbps-only products. That makes Fast Ethernet an even easier choice to make.

Intel's 10/100Mbps networking solutions

1 INTEL EXPRESS 10/100 STACKABLE HUBS	The 10/100 hub for a flexible transition to Fast Ethernet.
2 INTEL EXPRESS 10/100 SWITCHES	A complete switching solution from the desktop throughout the campus.
3 INTEL EXPRESS ROUTERS	WAN connectivity made simple.
4 NETPORTEXPRESS™ PRO/100 PRINT SERVERS	10/100Mbps connectivity for flexible transition to Fast Ethernet printing.
5 ETHEREXPRESS™ PRO/100 ADAPTERS	The award-winning 10/100 adapters that provide fastest total system performance for networked PCs.
5 ETHEREXPRESS PRO/100 SERVER ADAPTERS	An onboard Intel i960® processor keeps server CPU utilization low and throughput high.
5 ETHEREXPRESS PRO/100 MOBILE ADAPTERS	Extending 10/100Mbps to your portable PCs.

For the latest pricing, and more information on our FAST ETHERNET TRADE-UP PROGRAM, visit us on the Web or call 1-800-538-3373, extension 723. And tap into the flexibility that will keep your network flowing.

 www.intel.com/network/fe3.htm

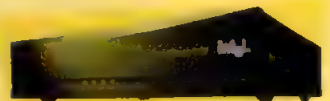
intel.



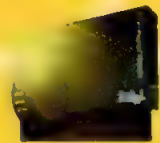
1 INTEL EXPRESS 10/100 STACKABLE HUBS



2 INTEL EXPRESS 10/100 SWITCHES



3 INTEL EXPRESS ROUTERS



4 INTEL NETPORTEXPRESS™ PRO/100 PRINT SERVERS



5 INTEL ETHEREXPRESS™ PRO/100 ADAPTERS

NEW!
A Different Way of Seeing



Vivid Imagination

Once again, Acer sets higher standards in performance, quality and value with the introduction of a new family of AcerView monitors designed to maximize your viewing experience. *Revolutionary Mini-Neck CRT Tubes* in selected models offer *Power Consumption Reductions Up to 46-Percent*, while Intelligent iScreen[®]* design makes customizing your favorite settings a snap. *With Sizes Up to 17" (15.7" viewable), Optional Attached Speakers and Dot Pitch Ranges from .28 to .25*, AcerView has the perfect flicker-free model just for you. Backed by Acer's 3-year limited warranty and outstanding reputation for reliability, they're all *Windows[®] 95 Plug'n Play Compatible*. Call 1-800-379-2237, Ext. 123 today for the dealer nearest you to see the new monitors from AcerView that display images so vividly, you'll question reality.



AcerView[™] Quality Monitors

CIRCLE 087 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

©Copyright 1997 Acer Components, a division of Acer America Corporation. All rights reserved. *iScreen not available with 350 or 550 models.

The Acer Components logo and AcerView are trademarks and iScreen is a registered trademark of Acer America Corporation and Acer Inc. Windows is a registered trademark of Microsoft Corporation. All other trademarks are the property of their respective owners. Vivid PCM 6/97 123

Power Notebooks Again Ascendant

It's easy, in this business, to be seduced by conventional wisdom and self-evident if unexamined truth. How many times have you heard someone say—or said yourself—that something about computers, or computing, was true simply because at first glance it

appeared to be so—and then, six months later, stumbled across the real truth, which was at considerable variance from what early on had seemed so obvious?

Me, too. Over time I've become skeptical about self-evident truths. Maybe this has to do with gaining wisdom with the years. More likely it comes from remembering lost opportunities that grew out of uncritical acceptance of others' pronouncements about what was manifestly so.

Lately the notion of learning from my own experience rather than listening to the prevailing wisdom has been reinforced as I've looked at and worked with early models of notebook PCs that have the spectacular new 13.3-inch, 1,028-by-768 active-matrix LCD.

Conventional wisdom has these machines pegged as high-ticket, niche-market rarities. The argument goes something like this: "Sure, the big display is nice, but you have to give up some battery life to get it. They're also too big, too heavy, and—worse—expensive, when notebook prices are creeping steadily down. A 12.1-inch 800-by-600 display is all anyone really needs. These will be classic niche products, admired by many but bought and used only by a tiny number of traveling presenters for whom show means more than go."

Sounds like a pretty good market analysis—and, I'm convinced, dead wrong. Well, not completely. Yes, they're a little bigger and heavier than comparable 12.1-inch-screen notebooks. Battery life is slightly shorter than on the best 12.1s. They cost more than today's mainstream notebooks. And they are killer tools for frequent presenters, who'll eat 'em up.

But I'm convinced, after a couple of months' experience working and traveling with one of the early 13.3s, that they're not going to be niche products forced into a tiny ghetto in the corner of the PC market. These aren't self-indulgent PCs for the overpaid and underbrained. And the merits of that 1,024-by-768 LCD go far beyond its virtues for the PowerPoint crowd.

Precisely because they're a little heavier and more

expensive, these clearly aren't going to be mainstream products, dominating the notebook PC market. But they aren't going to be pushed into the closet, either.

I've been using the new Gateway 9100XL. This is a powerful beast, boasting not only a 13.3-inch display but also a 166-MHz Pentium MMX CPU, 64MB of RAM, 4MB of VRAM, a 3GB hard disk, a USB port, NTSC video out, and lots more. It's certainly the fastest notebook I've ever used, and in fact it's more powerful than all but a few of the desktop PCs I've used. You pay for that power: The 9100XL costs \$5,999.

The 9100XL is the clear leader among the early 13.3-inch machines. All that power, speed, and functionality is packed into a case just 0.25 inches taller, 0.5 inches wider, and 0.75 inches deeper than Gateway's big-selling 2200-series mainstream machines. If you saw it sitting unopened on a desk, you wouldn't notice the extra size. Carrying it day in, day out, I do notice the weight: about a pound and a half more than the conventional notebooks I use, which run about 7 pounds.

The extra real estate required to accommodate a 13.3-inch display has been put to good use. The 9100XL not only has the best notebook keyboard I've ever used, it has—hallelujah!—a full-size keyboard. Best of all, Gateway puts a combo 3.5-inch floppy disk drive/standard CD-ROM drive into the machine, so you needn't decide which to carry on a trip (or surrender, grudgingly, and pack 'em both

in your already overstuffed bag).

I do believe a large number of notebook buyers will decide that the extra size and weight of the 13.3-class machines are more than offset by the advantages.

Price is a different matter. When corporate notebooks are settling into a \$2,500 to \$3,500 sweet spot, how can a business buyer justify spending twice as much, even on an undeniably better machine?

Clearly, most won't: These are not destined to be "fleet machines." I don't argue for a second that 13.3s are going to become mainstream notebooks this year or next. But that \$6,000 price will fall: Only the tiny trickle of 13.3-inch



BETTER AND BETTER
I'm convinced
that the new
13.3-inch-display
notebooks are
not going to be
niche products.

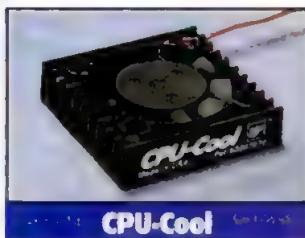
BEWARE OF THOSE WEARING BEARINGS!

Our CPU coolers last 10X longer than cheap imitations!



Typical Cooler

- Thick, kludgy design
- Sleeve-bearing fan (10,000 hrs.)
- Made in Taiwan

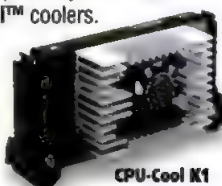


CPU-Cool

- Thin, integrated design
- Ball-bearing fan (100,000 hrs.)
- Made in USA (5-year warranty)

When you consider the likelihood of premature failure, cheap CPU coolers are no bargain. As their thin-film fan-bearing lubricant dries up, you're left with an irritating noise, higher CPU temperature, and the cost and hassle of replacement. So, protect your 486 and Pentium processors the right way! Use only genuine CPU-Cool™ coolers.

CPU-Cool 1.9T (486s & 75-133 Pentiums).....	\$21
CPU-Cool 1.9W (150-200 Pentiums).....	\$22
CPU-Cool 2.3W (AMD-K6, Cyrix 6X).....	\$24
CPU-Cool K1 (Pentium II).....(NEW!)	\$25
CPU-Cool 3.2 (P6).....	\$25
Dual CPU-Cool (P6, Fault-Tolerant).....	\$39



CPU-Cool K1

12th Year **PC POWER & COOLING, INC.** 1985-1997
5995 Avenida Encinas, Carlsbad, CA 92008, (760) 931-5700, (800) 722-6555, Fax (760) 931-6988

Web: <http://www.pcpowercooling.com> Hours: 7 a.m. - 6 p.m. (PT) Mon-Fri. We accept Visa, MC, COD, or PD on approved credit.
CPU-Cool and Dual CPU-Cool are trademarks of PC Power & Cooling, Inc. Pentium is a registered trademark of Intel Corp. © 1997 PC Power & Cooling, Inc.

CIRCLE 080 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

Best of the Best.

EDITORS' CHOICES

See who we picked, and why.

In every product category.

www.pcmag.com



BOOKMARK
The Benchmark

JIM SEYMOUR

displays available to manufacturers, as well as the willingness of early adopters to pay gee-whiz prices for gee-whiz machines, is propping up that premium price. By year's end you'll see more reasonable prices for 13.3s, and by this time next year they'll be on the edge of mainstream pricing, if not yet quite there.

Part of that downward price pressure will be from the even bigger displays coming later this year. Vendors have been showing notebooks with 14- and 15-inch displays privately for a couple of months now. IBM says it will be selling 14-inch-display ThinkPad units later this year. The 15-inch models will be among next year's flashiest products.

So are 13.3-inch-display notebooks destined for a short life, soon to be eclipsed by even bigger screens? In terms of PR, probably; in terms of practicality, no.

I'm wary of saying that 13.3 inches is enough. Lots of good people before me have made that kind of pronouncement about 10.4-inch, 11.1-inch, and 12.1-inch active-matrix color displays—each of which seemed big enough in its day. The bigger displays will gain market share, to be sure, but I think they're the ones that will fall into the niche-market slots. There is a balance about this Gateway and its screen size that feels *right*. Crank up the screen to 14 inches or 15 inches and you've gone beyond what I want to carry around.

This praise for a relatively big and heavy 13.3-inch display may sound a little hypocritical coming from someone who's called for 4-pound notebooks for so long, and who said here just eight months ago that Hewlett-Packard's little OmniBook 800 was one of the unheralded products of the year for 1996.

I don't see it that way. The OmniBook units (today even better and faster) are sensational grab-it-and-go machines for those to whom size and weight mean everything.

But as we move farther down the path of power computing, machines that would have seemed laughably muscle-bound a few months ago now make a lot of sense. We'll see a wave of 13.3-inch-display machines this year; they were everywhere on the floor and in the NDA suites at Spring Comdex and, a month later, at PC Expo in New York. For now, Gateway's got the early winner, and it's such a great machine it should surf that wave successfully.

The real obstacle to wide adoption of 13.3-inch-display notebooks is the powerful tug of conventional wisdom. Listen to the mutterings and you'll pass on 13.3s. But try one for an hour and you'll be reaching for your credit card. □

In the Interest of Everyone

There's a little larceny in all of us. Who hasn't taken home a ream of copier paper for the home printer, figuring that at least some of the paper will be used for company reports done off-hours? The savvy company shouldn't look too closely when

employees—ah—reallocate supplies and services. The argument goes like this: You could give everyone a \$500 raise. Or you could avert your eyes as coworkers reallocate the equivalent in copier paper, pens and pencils, floppy disks, personal long-distance calls, and the occasional overnight parcel. Whatever the economic cost to the company, the psychological benefit to the employee is greater, so it's a better deal to be like Sergeant Schultz in "Hogan's Heroes" and say, "I see nothing."

Besides, it's going to happen anyhow.

We love personal computers because of the expanded possibilities for personal benefit. To many people, that seems a fair trade-off because the company is increasingly asking for more personal contributions from us. Who hasn't had to finish a report or check e-mail, from home, in the late hours of the evening?

Why is all this important beyond the pop psychology involved? Because in subtle and not-so-subtle ways, our personal preferences affect what we buy in the workplace. All things being equal, it's human nature to pick the product that somehow benefits you more, especially if you see little or no harm to your company in doing it. That might be because of what you own, because of what you do, or maybe because of what you don't own at home and want the workplace to provide. Usually, there's no downside for the company, but it's something a manager wants to keep an eye on to ensure that the situation doesn't go unchecked.

Take portable computers, for instance. For most people, especially those who travel or work outside the office, there's more productivity in a notebook PC than a desktop PC—the total value of ownership is greater, since you can take the notebook with you. But if your company is straddling the fence over which one to buy—some companies panic because the initial cost for portables runs higher—you as an individual are more likely to argue for a portable computer because you can take it home nights and weekends. That gives you an extra PC at home in the evenings when your kids want to do homework.

Or printers. In the case of business printers, there's always

a tug of war involved in the ratio of personal to departmental printers. Companies like network printers because they're cheaper to run and easier to administer. Individuals like personal printers because they're private: You don't have to race over to the network printer cubicle to retrieve your document—or resume—before someone else

sees it. Also, if your home printer takes the same cartridge as your office printer, then there's an opportunity for you to utilize the cartridge either at home or at the office. This way, you'll have covered the most expensive part of the printer, since over the life of an ink jet printer you're likely to spend more for ink than for the printer itself. And besides, one can again argue, a lot of that home printing is for company reports. In the case of printers, it may be that your company's buying patterns shape yours: You buy what the company has.

Or online services. Everyone has e-mail and probably Internet access, but many of us also want to be able to access an online service (America Online, CompuServe) from the office as well, for two reasons: to research material that isn't available on the Internet, and also to have a private mail account that the company can't tap into. (Sending out your resume or love letters via your company's e-mail just begs for trouble.) Perhaps, if your job warrants access to such research material, you can get the company to spring for that account.

Of course, the blurring of the lines between personal and professional interest

in a product doesn't start just with buying decisions. Consider the trade shows for a moment. If you've ever attended the huge Fall Comdex in Las Vegas, by midweek you see a sea change. Attendees who have spent Monday through Wednesday pondering which laser printer to buy for their companies in 100-lot quantities shift gears and start looking at home PCs and ink jet printers to buy in 1-lot quantities for their families at year's end.

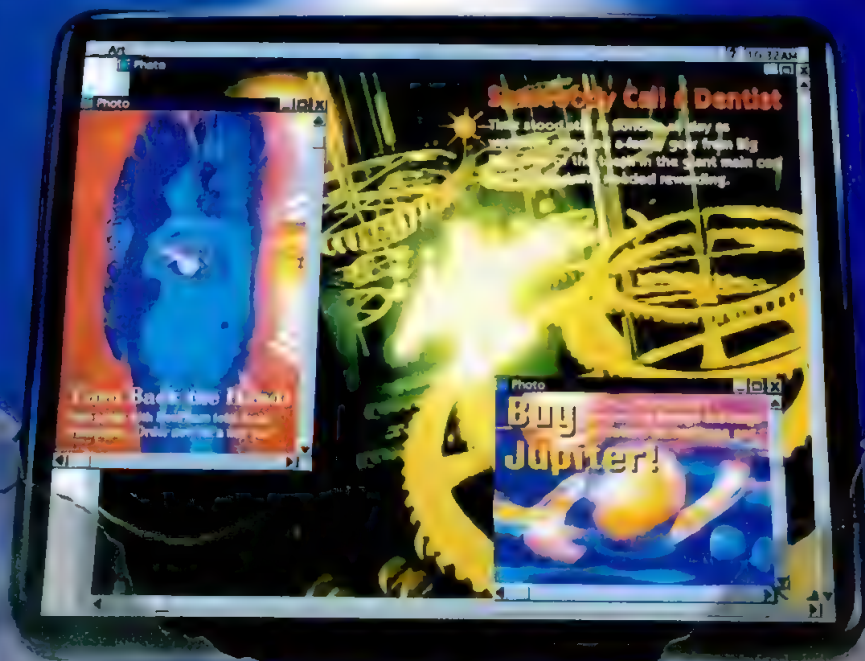
Ethically, we're in a gray area with respect to the interaction of our personal and professional buying decisions. As a practical matter, this is the way business gets done. As long as it doesn't get out of hand, everyone benefits. □



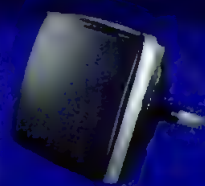
PERSONAL CHOICES

In subtle and not-so-subtle ways, personal preferences affect what we buy at work.

A breakthrough so visually advanced
it leaves mere specs behind.



The MICROFILTER cathode ray tube is a brilliant breakthrough based on Toshiba's totally new approach to visual technology — relying far more on innovation than improved specifications. The result is a 30% increase in both brightness and contrast over our conventional CRTs. MICROFILTER utilizes original Toshiba technology — forming the micro-particulated material



layer with primary color filters. Thus, shadow mask technology advances to a whole new level, surpassing even the aperture grill technique. Moving images are clear and bright; text is sharp and readable. In other words, MICROFILTER technology realizes the full visual potential of multimedia. Break through to a new level of brightness and contrast. The Toshiba MICROFILTER CRT.

microfilter^{CRT}

More That Meets the Eye

<http://www.toshiba.com/taec>

In Touch with Tomorrow
TOSHIBA

CIRCLE 379 ON READER SERVICE CARD

Toshiba America Electronic Components, Inc., Electron Tube and Device Division
One Pkwy., North, Suite 500, Deerfield, IL 60015, U.S.A. Tel: (847) 945-1500 Fax: (847) 945-1044

NETWORK EDITION

REMOTE ACCESS

Industrial-Strength Connections

A two-part series dissects eight enterprise-level remote-connection servers. Catch both issues!



By Steve Rigney

With enough remote users to populate a small town, many ISPs and large corporations need remote-access servers that can handle a hundred or more simultaneous calls without falling to their knees. While scalability is the first thing that comes to a network administrator's mind when evaluating corporate remote-access servers, there are a handful of other important points to consider. A good enterprise access server must handle both digital and analog circuits, provide a low

ILLUSTRATION BY MARK SHAVER

INSIDE



Maintaining a sizable band of roaming employees is now the rule for most corporations. To do that, you need a remote-access server that will be easy to maintain and support. For this story, we turned to contributing editors Les Freed and Steve Rigney and our crack labs staff—project leader Robert Norton and technical analysts Russell Iwanchuk and Kevin Young—to put enterprise-level servers from Ascend, Bay Networks, 3Com, and the former U.S. Robotics through the ringer. We'll be covering servers from Cisco, Gandalf, Microcom, and Shiva in the next issue.

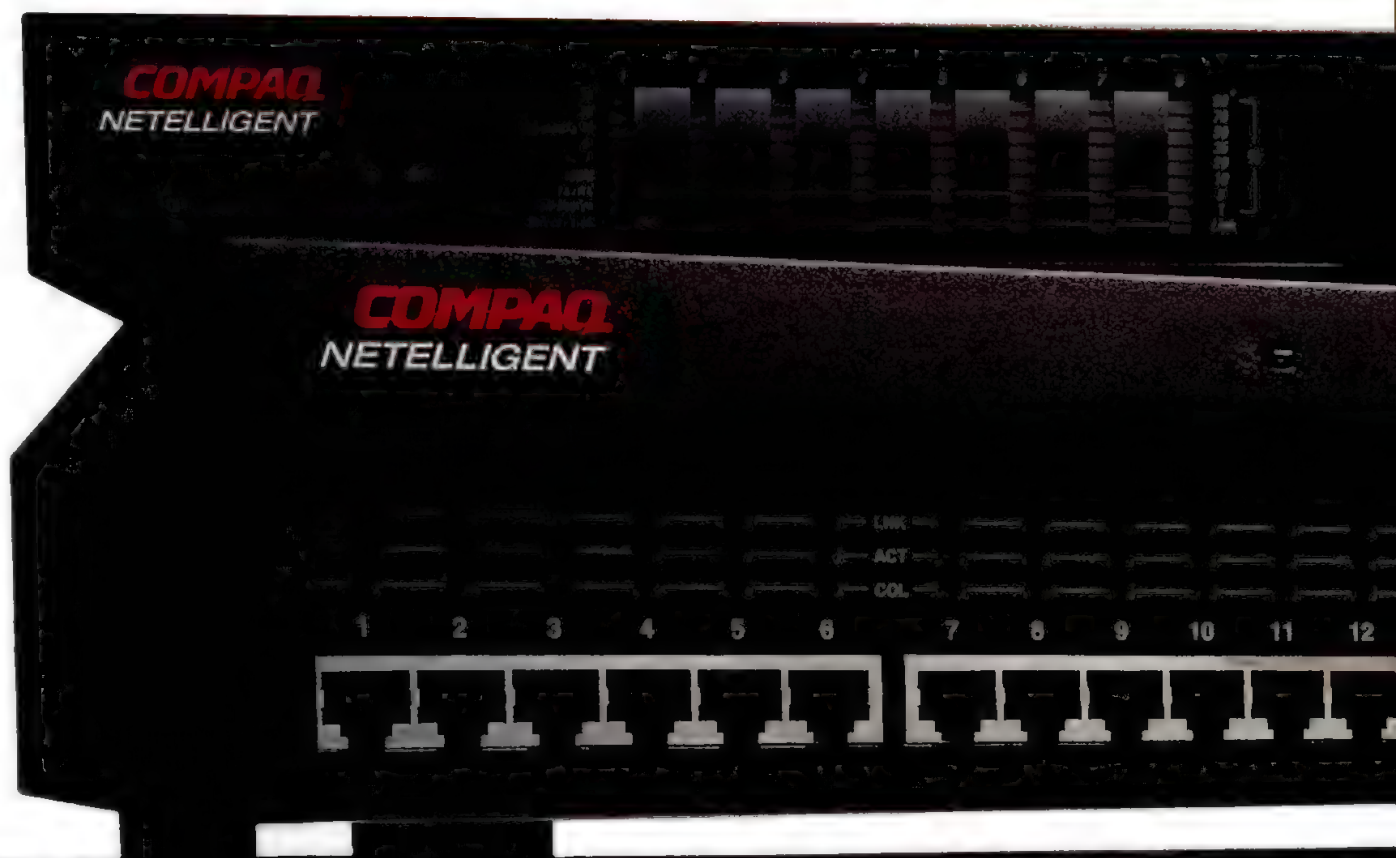
GETTING CONNECTED to the corporate network in a reasonable time and staying there is all most remote users are after. But that isn't as easy as it sounds. In addition to installing and configuring these products, we also did some heavy-duty performance testing. We loaded up each of the servers with as many as 75 clients, mixing both analog and digital calls, and then watched what happened. For more information, stay tuned.

IN LINE WITH OUR remote-access theme, contributing editor Les Freed reviews the Front Desk from Jetstream in this issue's First Looks. No matter where you are, this ISDN quasi-PBX for the small and home office can find you and get your calls through.

REGARDLESS OF THE SIZE of your network, backup is an issue. Contributing editor Steve Rigney takes a look at the newest backup offering from Stac Electronics—Replica for NT Single Server Edition. Though this product doesn't have the capabilities of some higher-end backup solutions, its price and the capabilities it does have are right.

—Sarah L. Roberts

**In an ideal world, the company you trust
and servers would make
Welcome to an ideal world.**



©1997 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. Netelligent is a trademark of Compaq Computer Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. In Canada, we can be reached at 1-800-567-1616.

for PCs
switches too.

Wouldn't it be great to get the same quality and performance in your switches that you've come to expect from your PCs and servers? Wouldn't it be Utopia? At the very least it would be close.

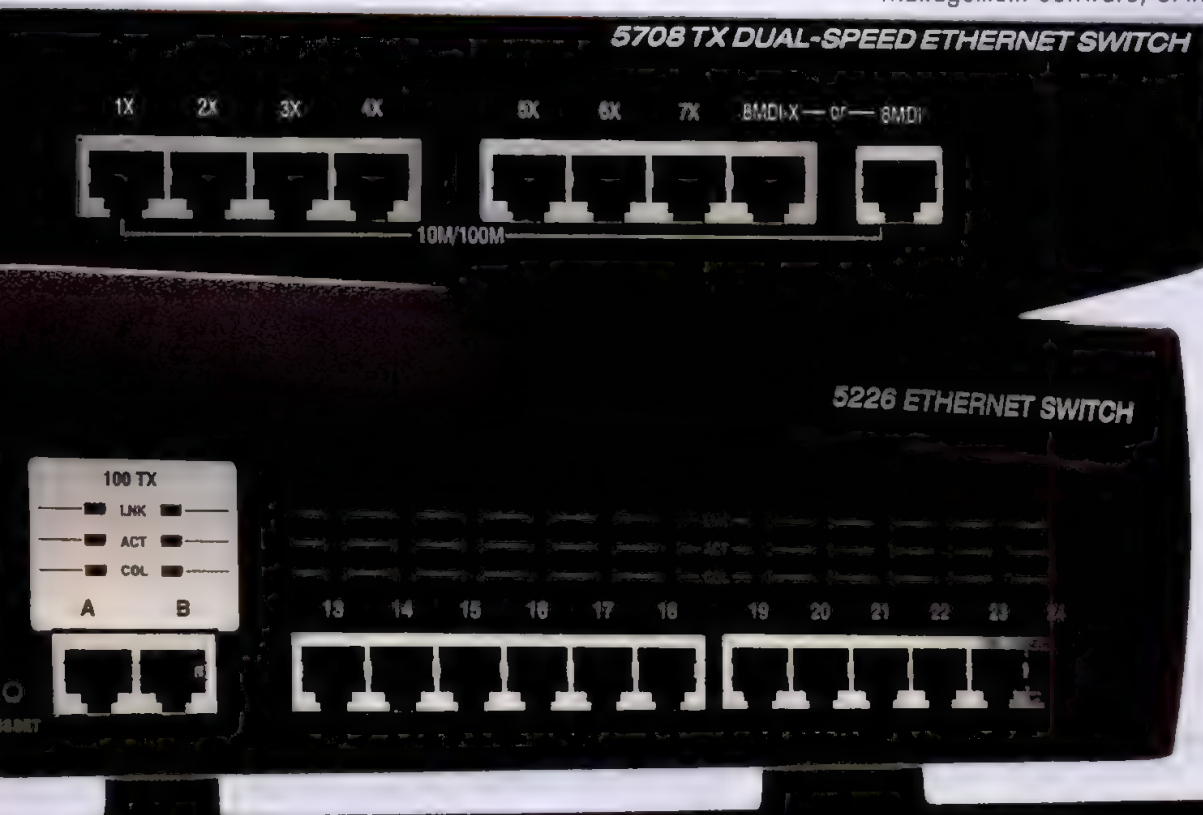
Introducing the newest additions to the Compaq Netelligent Switch family that provide breakthrough bandwidth easily and affordably. Like the Netelligent 5708 Dual-Speed Ethernet Switch. Because it's autosensing, all 8 ports automatically configure to either 10 or 100MB/s at full- or half-duplex for truly flexible migration.

Then there's the Netelligent 5226 Workgroup Ethernet Switch. It lets you manage your workgroups at desktop switching prices. With 24 Ethernet and 2 Fast Ethernet ports, all with full- or half-duplex operation, you can future-proof your network, boost performance and relieve bottlenecks. And thanks to Compaq ASIC technology, it delivers fast access to your applications at wire-speed.

Additionally, our Netelligent switches with modular designs let you configure solutions to match your needs. Other innovative features include a hot-swappable, dual-redundant power supply and built-in manageability with Compaq Netelligent Management Software, SNMP, Telnet, VLAN

and RMON probe support.

Netelligent switches from Compaq. In a world where you don't expect anything to be ideal, isn't it refreshing to find a few things that are? For more information visit us at www.compaq.com/products/networking or call 1-800-645-6645.



cost of ownership, offer sustained performance, and not require a full-time person to install and maintain the system. In this two-part roundup, we look at eight of the largest and best remote-access servers on the market. These products are designed to meet the needs of ISPs, telecommunication carriers, and large corporations that have to deal with thousands of calls a day. As you'll see, some of the products proved better at this than others.

Given the number of products and the detailed testing involved, we decided to extend this roundup across two issues. The first looks at four of the products and discusses issues of cost and configuration. In the next issue, we'll review four more products, name an Editors' Choice, discuss scalability and management, and present individual performance results.

On our tests, we looked at the Ascend Max 4048, Bay Networks 5399 Remote Access Concentrator, Cisco AS5200 Access Server, Gandalf Xpressway RLAN, Microcom Access Integrator 1700, Shiva LanRover Access Switch, 3Com AccessBuilder 5000, and 3Com Total Control Enterprise Network Hub. We requested units capable of handling up to 60 analog modem connections and 15 ISDN digital calls. The Max 4048, the AS5200 Access Server, the LanRover, and the Total Control Hub each required us to use two units for our test configuration. The Total Control Hub can handle up to 235 ISDN calls but is limited to 48 analog connections. We also requested units that could handle both digital T1 and primary-rate interface (PRI) WAN connections. The Access Integrator and AccessBuilder provided

WAN interfaces that can handle both T1 and PRI connections.

COST OF OWNERSHIP AND RELIABILITY

With prices from \$20,000 to \$90,000, depending on configuration, these products are major investments. But cost of ownership goes beyond even those substantial price tags, encompassing training and support, and it's related to important product considerations such as management, performance, and scalability.

These products can take a lot of time and brainpower to install, configure, and maintain. Unless you have a VAR to lean on, you should consider formal training. Most of the vendors in this roundup provide some type of on-site or classroom-based training classes. For example, Cisco and Shiva offer off-site training courses at least three times per quarter. The classes cover different aspects of the hardware and the software and provide different skill levels. You can expect to pay approximately \$500 a day for these classes, plus traveling expenses. Most of the vendors also offer training at your location.

WARRANTY AND SUPPORT POLICIES

Knowing how to configure an access server doesn't mean you can fix it when it breaks down. All of the vendors provide basic warranties, but most warranties are limited to two years and cover only replacement parts. Optional protection plans vary in features and price. For example, Shiva (reviewed in Part 2) provides two service plans: on-site and per incident. A

five-incident service contract from Shiva costs \$600, or you can purchase on-site support and service for \$2,000 a day. Microcom (also reviewed in Part 2) offers different support plans, ranging from basic telephone technical support for about \$1,000 to high-end phone support with some on-site service for \$9,000. Before purchasing any of these products, you should evaluate the cost of warranty and technical-support plans that don't provide much long-term help.

One way to avoid costly service and replacement costs is to look for good hardware. But as we found, information about reliability is hard to get. Two data points you can use are any published *mean time between failure* (MTBF) ratings for the equipment and whether the manufacturer's plant is certified by the International Standards Organization (ISO). The ISO has a set of standards covering quality assurance, manufacturing, and product testing. We found that some products, such as the AccessBuilder 5000, are built in a facility conforming to ISO 9002, which covers manufacturing and installation. Other vendors, including Cisco Systems, have ISO 9001 certification that covers a company's design, development, production, installation, and service procedures.

Shiva is working on getting ISO certification. Representatives of 3Com quoted a MTBF of 85,514 hours, compared with a quote of 50,000 from Bay Networks. ISO certification and MTBF testing add significantly to the cost of production, but they are useful indicators of product reliability.

Another factor to consider is the impact



REMOTE-ACCESS SERVERS

How to Read the Suitability to Task Boxes

Cost of ownership *Cost of ownership* refers to the unit's price and other hidden factors such as the quality of technical support, availability of training classes, and warranty information. We also looked at ISO certification and the mean time between failure (MTBF) ratings of the hardware components.

Management and security We looked for a strong graphical management utility that lets you monitor the health of the access server and at least generates an error log if there's a problem. A good utility should also help you monitor individual users and their connecting ports. For security, we required the bare minimum of user names and

SUITABILITY TO TASK

Product name

Cost of ownership	Excellent
Management and security	Good
Performance and scalability	Fair
Installation and configuration	Poor

passwords and looked closely at the product's ability to work with a RADIUS or TACACS security server.

Performance and scalability This rating is based on the results of our

performance tests. *Scalability* has two definitions: the ability to handle a load and how many ports a single device can handle. For load handling, a

perfect score required more connections without a loss of performance. A truly scalable access server could also easily handle our filter of 75 client connections (and even more) in a single chassis.

Installation and configuration The access servers in this roundup are complicated devices, so we expected to spend several hours setting them up, but not days. For an *excellent* rating, a product had to offer excellent documentation and an easy-to-use application for installing and configuring. We gave extra points if a server provided a graphical installation utility and did not require the use of a terminal or cryptic Unix-based commands.

A virus sees no walls

between continents, nations, networks or desktops . . .

INTEL

NOVELL

NETSCAPE

SUN

CONTROL DATA

WORLDWALK

NETMANAGE

TREND

. . . which is why you'll find us

EVERYWHERE.

From our desktop to yours, wherever you are, we're there.

Trend Micro's (NASDAQ: TMDR) anti-virus software is the most powerful

in the world. It's the only one that can protect you from the most dangerous

and most common threats to your computer.

So, when you need complete virus protection, look no further.

Visit our Trend Micro website for more information.

www.antivirus.com/pcmag.html
1-800-238-9983

TREND
MICRO

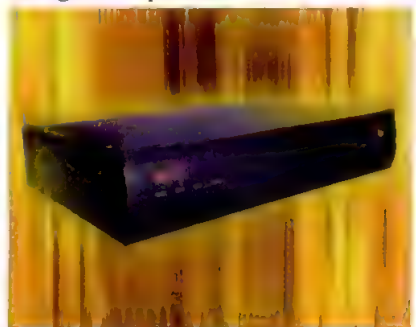
Computer Virus Protection for the Internet
© 1999 Trend Micro, Inc. All rights reserved.

and duration of downtime when the product does break. With the exception of the AS5200 Access Server, LanRover Access Switch, and Max 4048, all of the units in this roundup offer hot-swappable modules for the modems and interface cards, as well as redundant power supplies. The ability to swap cards with the power on lets you replace a faulty card without taking down the entire system. For quick troubleshooting, the AccessBuilder 5000, Access Integrator, and LanRover Access Switch let you turn off a single faulty modem chip on a module without replacing the module.

In the next issue of the Network Edition, we'll provide reviews of four more products and name our Editors' Choice. We get you started here with four major remote-access server products.

Ascend Max 4048

The smallest product in this roundup is the Max 4048, from Ascend Communications (\$52,800 for our test configuration, which consisted of two units). It combines the functions of a remote-access server, a modem bank, and an IP/IPX router in one desktop PC-size box. The product's performance was above average; it came in third on our tests. But on the downside, Ascend does not offer any expansion options for the Max 4048; the company calls it a fixed-configuration product.



TAKING IT TO THE MAX: The Max 4048 contains flash-upgradable K56flex modems.

The Max 4048's operating software provides a full-featured IP router, a SLIP server, and SNMP remote management, and it supports PPP and Multilink PPP dial-up protocols. The unit can handle inbound traffic from a mix of frame-relay, ISDN, and modem clients. It comes with two T1 connections, 48 digital modems, a single Ethernet port, and a V.35 high-speed serial interface. Ascend makes larger Max products aimed at large Internet service providers, but the Max 4048

SUMMARY OF FEATURES

Enterprise Remote-Access Servers

	Ascend Max 4048	Bay Networks 5399 Remote Access Concentrator	3Com AccessBuilder 5000	3Com Total Control Enterprise Network Hub
Product listed in alphabetical order				
List price for tested configuration	\$26,400*	\$49,380	\$95,515	\$38,636
Number of analog ports server can accept	48	624	120	48
Number of ISDN ports server can accept	48	598	368	230
Maximum number of simultaneous users	48	624	368	230
Dial-out capability	■	■	■	■
Multilink PPP for ISDN	■	■	■	■
Maximum number of WAN interfaces	2	26	16	20
Connectivity to form a WAN	■	■	■	■
Bandwidth aggregation over the WAN	■	■	■	■
Network Communication Protocols Supported				
IPX/SPX, PPP, TCP/IP	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
NetBIOS/AppleTalk	■ ■	■ ■	■ ■	■ ■
Security				
Callback	■	■	■	■
Callback to user's current number	■	■	■	■
Data encryption	■	■	■	■
Log-on integrates with NetWare Bindery/NDS/Windows NT domains	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
User-connection time limit	■	■	■	■
Password authentication	■	■	■	■
Management Software				
Runs on Windows 3.x/Windows 95	■ ■	■ ■	■ ■	■ ■
Runs on Windows NT server/workstation	■ ■	■ ■	■ ■	■ ■
Runs on Unix	■	■	■	■
Reports on log-ons/failed log-ons	■ ■	■ ■	■ ■	■ ■
User can configure/reset individual ports	■ ■	■ ■	■ ■	■ ■
User can monitor individual ports	■ ■	■ ■	■ ■	■ ■
SNMP-compatible/Remote-console capability	■ ■	■ ■	■ ■	■ ■

* IPX support requires purchase of an optional \$4,000 software bundle.

was designed as a corporate and small-ISP remote-access router. With a cost of \$550 per port, this is one of the least expensive products in our roundup.

The digital modems in the Max 4048 are K56flex-compatible. Ascend was one of the first remote-access vendors to embrace the K56flex modem standard, and the company has promised these modems will be software-upgradable to the pending open 56K standard when that becomes final.

NetWare shops may want to add the Remote Networking Software option (\$4,000), which adds IPX and AppleTalk routing as well as protocol bridging to the basic Max unit. The option also includes Ascend's MAX-Dial, which lets those on the LAN use the Max's digital modems for outbound data and fax calls, as well as MAXLink software, which lets dial-up clients access shared LAN resources.

As with most Ascend products, you configure the Max 4048 using its built-in configuration menu. The menu is available via direct connection to the Max's RS-232 port or via TCP/IP telnet. Though imposing at first, the menu system is one of the easiest and fastest to use once you learn your way

around. Ascend offers a three-day, \$1,200 course on Max installation and management at many locations across the country.

The Max 4048 supports a broad array of user authentication protocols, including CHAP, PAP, RADIUS, and TACACS. It also provides additional security through Call-

ing Line ID and callback, although callback is supported only on ISDN and switched-56 connections. In case you need firewall protection, the \$4,000 Ascend Secure Access firewall runs on the Max platform with no additional hardware.

SUITABILITY TO TASK

Ascend Max 4048

Cost of ownership	Good
Management and security	Good
Performance and scalability	Fair
Installation and configuration	Good



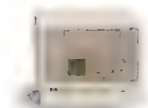
DLT Library
4115e/r



MFC Library
406r



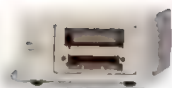
T9i



DAT2400



CD Writer
6020e



DLT40e



DAT24e

Consistent. Reliable. Beige.

**Just the
qualities
you look
for in data
storage.**

The only statement a storage solution should make is, "Don't worry." That's why HP puts product reliability way ahead of appearances. Any HP SureStore™ equipment you choose has undergone the most rigorous testing in the industry.

Whether you need a CD writer to archive files at your desktop or state-of-the-art DAT autoloaders to backup an entire network, more people trust HP than any other brand. They're compatible with every popular operating system. And every one comes backed by HP's rightly famous world-wide service and support. So be sure you've got HP SureStore storage. If the dependability doesn't lull you to sleep, the color will.



1-800-249-4057 DEPT.
465

NETWORK EDITION

COVER STORY

A new member of Ascend's Max product family, the Max 4048 is designed specifically for remote access. It is comparable in features and performance to a similarly configured Max 4002 but costs less. In exchange for the price cut, you sacrifice a little flexibility.

If your needs outgrow a single Max 4048, you can stack multiple Max units using Ascend's Max Stack technology, which lets several Max 4000-series units operate as one larger unit. With Max Stack, IP address pools and bandwidth are shared, and incoming Multilink PPP calls can span any available T1 channels on any of the stacked units.—*Les Freed*

Ascend Max 4048. List price: Tested configuration, \$52,800. Ascend Communications Inc., Alameda, CA; 800-621-9578, 510-769-6001; fax, 510-747-2300; www.ascend.com. Circle 951 on reader service card.

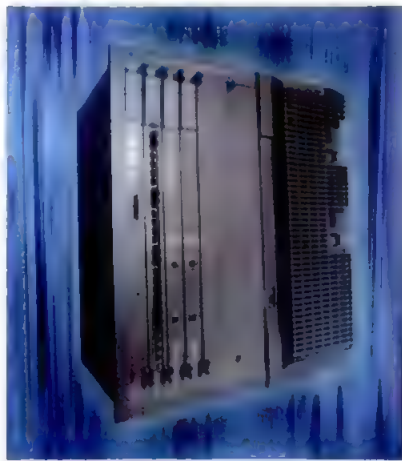
Bay Networks 5399 Remote Access Concentrator

Bay Networks' remote-access server is actually a module called the 5399 Remote Access Concentrator (\$19,995 list) that sits in the vendor's 5000 Multi-Service Access Switch or MSX (\$4,495 list). The 5399 module provides two channelized T1/PRI interfaces and 48 digital modems on a single hot-swappable card. Other modules available for the MSX include hub cards and Ethernet switches as well as routers. Our tested configuration, with its two PRI interfaces, performed and scaled very well indeed—placing second—and its price per port was also among the lowest of the group. But its Unix-based management and security features are just basic, and installation was noticeably more difficult than with the other products we tested.

You can install up to 12 of these 5399 units in the 14-slot 5000 MSX chassis for a total of 576 analog lines, or 552 basic-rate interface (BRI) ISDN connections in a single box. In addition, you can install and manage up to four MSX chassis, for a total of over 2,300 modems in one single 8-foot rack.

As with all the products in this roundup except for Microcom's Access Integrator and 3Com's AccessBuilder, you can

change settings on the 5399 card between T1 and PRI through software. The on-board modems can determine whether each incoming call is from a digital ISDN or an analog device and direct it properly. The digital modems, which currently run



THE BAY'S THE LIMIT: One 5000 MSX chassis can support over 500 remote connections.

at V.34 speeds, are completely flash-upgradable. By the time you read this review, Bay Networks expects to offer a free upgrade to its new K56flex 56-Kbps modems.

For installing and configuring the 5399 module, you can use a graphical utility called Quick 2 Config or command line options on a terminal. We encountered some notable problems during the installation when communicating with our test switch and setting up a pool of IP addresses, but we were able to resolve these issues with two days of on-site help from

Bay Networks' technical support. The documentation is fairly well written, and it also comes on a CD-ROM. The vendor additionally offers training classes for users on handling the configuration utility and the command line options.

Unlike the other products in this roundup, the 5399 module requires a PC running Windows NT or a Unix workstation to serve as the host for the access server. You use the host to configure, provide authentication, and keep system logs of the access server's activity. A single Windows NT or Unix host can operate with multiple 5399 modules installed in different chassis. Unfortunately, this product doesn't perform its own authentication. But as an alternative, you can use a third-party security device such as a RADIUS server.

The only graphical management utility Bay Networks bundles with the 5399 module is a Unix-based utility called Annex. If you don't have a Unix workstation, you can manage the box by using the command line options on a terminal connected to the unit. Last but not least, the 5000 MSX and 5399 models also include SNMP MIBs, which readily permit you to send traps and alerts to an SNMP management console.—*Steve Rigney*

Bay Networks 5399 Remote Access Concentrator. List price: Tested configuration, \$49,380. Bay Networks Inc., Santa Clara, CA; 408-988-2400; fax, 408-988-5525; www.baynetworks.com. Circle 952 on reader service card.

3Com AccessBuilder 5000

When we first saw 3Com Corp.'s AccessBuilder 5000 (tested configuration, \$95,515 list), we thought it was a mislabeled Microcom Access Integrator (\$50,705). The chassis, modem cards, and T1 and PRI cards were all identical. Like the Access Integrator, the AccessBuilder 5000 isn't extremely scalable for its size, but it does offer excellent management, and it's easy to configure and maintain. Unfortunately, the product didn't fare especially well on our tests (it came in fifth out of eight), and it was by far the most expensive product in this roundup.

To end some of the confusion between the AccessBuilder 5000 and the Access Integrator, let's look at their different components. The 17-slot chassis is built by 3Com, and all of the digital modem cards and WAN interfaces, including T1 and PRI, are manufactured by Microcom. Some of the few differences between these two products are the type of access server engine each uses (the AccessBuilder 5000 includes the 3Com Packet Processor, and the Access Integrator uses the Cisco 2511) and the price tags.

Other differences between these units are the number of WAN interfaces they each can handle. The AccessBuilder 5000 can accommodate a mix of four T1s and five PRI connections. But in case you want to use only ISDN connections, you can install up to 16 PRIs in a single chassis, for a total of 368 connections. Our tested configuration included 72 analog and 46 digital modems. The Access Integrator is sold with a choice of either five T1s or five PRIs. The dual Packet Processors are limited to 60 simultaneous connections

SUITABILITY TO TASK

Bay Networks 5399 Remote Access Concentrator

Cost of ownership	Good
Management and security	Good
Performance and scalability	Excellent
Installation and configuration	Poor

Now that APC Smart-UPS® includes FREE web-enabled PowerChute® *plus*, protecting network uptime has never been easier



"...Inherent flexibility and excellent software... Don't be caught without one."



Power problems attack networks relentlessly. To protect hardware and data from system crashes, experts, network managers and computer users worldwide prefer one solution above all others combined: APC Smart-UPS. Now, all 120V Smart-UPS include FREE PowerChute *plus* power management software.

The most reliable protection you can buy

Smart-UPS provide complete protection against power spikes, surges, brownouts, and blackouts. You'll also gain maximum server uptime and decrease management costs. Award-winning features include:

- CellGuard™ intelligent battery management monitors battery performance and extends battery life.
- SmartSlot™ internal accessory slot lets you customize and enhance the performance of your Smart-UPS.
- QuickSwap™ user-replaceable batteries can be quickly and safely swapped out without powering down the connected equipment.



PowerChute *plus* provides unattended system shutdown and UPS management for Windows NT, Netware and other servers. Manage Smart-UPS via SNMP, DMI and Web browsers (shown above). Features vary by operating system.

Plan for and control crisis situations

PowerChute *plus* FlexEvents™ lets you control UPS reactions to power events. You can configure PowerChute *plus* to provide graceful, unattended server shutdown during an extended power outage or alert you to out-of-bounds environmental conditions before they result in costly downtime.

Web server and SNMP ready

APC's NEW WebAgent™ allows you to monitor and manage your Smart-UPS using your Web browser. New WebAlert™

notifies users of Web server shutdown via their browser. PowerChute *plus* also includes the PowerNet™ SNMP Agent

plug-in, which allows you to integrate your Smart-UPS with your existing SNMP management strategy.

Smart-UPS and PowerChute *plus* provide the complete solution in one convenient box. Server protection and peace of mind have never been easier.

Trade-UPS!

Fax or mail this coupon to APC and learn how you can easily trade in your old UPS for discounts towards a new Smart-UPS.

- ☐ **YES!** I'm interested in trading up a competitors' or an older APC UPS to Smart-UPS. Please send Trade-UPS info.
- ☐ **NO** I'm not interested at this time but please send my FREE power protection handbook.

Name: _____
Title: _____
Company: _____
Address: _____

City/Town: _____
State: _____ Zip: _____ Country: _____

Phone: _____
Brand of UPS used? _____ # _____
Brand of PCs used? _____ # _____
Brand of Servers used? _____ # _____



(888) 289-APCC x8187
Fax: (401) 788-2767
<http://www.apcc.com>

Dept. 64-01

NETWORK EDITION

COVER STORY

and work with fewer network protocols than the Access Integrator's Cisco 2511. A nice feature of the Packet Processors is that the 16 asynchronous ports on the front of the card can be used to connect standard external modems. Each external modem that you use, however, has the disadvantage of preventing you from



TWINS? The AccessBuilder and Access Integrator share many key components.

using one of the internal modems.

The 3Com installation is fairly straightforward. The only problem we encountered was a faulty T1 card. Although you have to use a terminal to set up the unit's initial IP address, you perform the rest of the installation by using a graphical utility. 3Com provides a copy of Microcom's expressWatch to help users with configuring the modem cards and the WAN interfaces.

The brain behind the AccessBuilder 5000 is its Packet Processors, which keep track of configuration information. The 3Com Transcend AccessBuilder Manager, a graphical application, uses the Advanced Distribution Management Module (ADMM), an SNMP-based management module, to find out what is physically present in the chassis. It then talks directly to the Packet Processor to set up all of your users and the type of protocols they will use once they're connected to the network. In addition, the AccessBuilder

5000's router includes basic user name and password security, and it will work with most third-party RADIUS and TACACS security servers.

In order to connect the product to your LAN, you must install an EtherFlex hub module. This module is available in 4-, 8-, 12-, and 16-port 10BaseT configurations, and it lets you divide the eight internal LAN segments of the AccessBuilder 5000 and connect them to different devices on your network.—SR

AccessBuilder 5000. List price: Tested configuration, \$95,515. 3Com Corp., Santa Clara, CA; 408-764-5000; fax, 408-764-5001; www.3com.com. Circle 953 on reader service card.

3Com Total Control Enterprise Network Hub

Sitting in its impressive-looking box with its 15 cooling fans, the Total Control Enterprise Network Hub (tested configuration, \$38,636 list), from 3Com Corp., is an extremely flexible solution that lets you choose from multiple hot-swappable modules to populate the chassis. These modules include T1, E1, and PRI WAN interfaces; analog, analog/digital, and digital modem cards; an SNMP management module; and two types of remote-access servers. Although it's very scalable for digital connections, the Total Control Hub doesn't handle as many analog calls as the other products we tested. In addition, the Total Control Hub came in second-to-last on our performance tests.

The Total Control Hub, formerly a U.S. Robotics product, provides 17 slots and two redundant power supplies in a 19-inch rack-mountable chassis. You can install up to 16 Network Access Cards (NACs) in the chassis, but the last slot is reserved for the Network Management Card (NMC). The NACs include the remote-access servers and WAN interface cards and provide their own network interface connection on the back of the chassis. Our tested configuration consisted of two Total Control Hubs, each of which came with 48 analog and 46 digital modems.

You can install up to five dual-PRI cards in the unit, for a total of 235 ISDN connections, but you can have a total of only 48 analog connections using a single dual-T1 module. This limit is imposed by

DID YOU KNOW YOU CAN SHARE YOUR PRINTER OVER YOUR NETWORK?



Ringdale's new pocket-size **Fast Port** Printserver allows you to connect any laser, line, dot matrix or inkjet printer to a **10baseT** or **100baseTX** Ethernet network. It is the world's most compact printer-to-network printer connectivity solution.

The **Fast Port's** auto-detect function enables the Printserver

to negotiate your network type. Any Internet Browser can manage the unit. Over a Local Area Network its **Printset™** software ensures that its management is unrivalled, enabling quick and easy installation onto any network environment.

A Windows-based TCP/IP printing system is also included in the package, allowing **Internet** access to the printer as well as Local Area Network (LAN) printing.

This product offers network operating support and can also be managed by **PeripheralVision™** Network Management Software over the Internet.



RINGDALE call us toll free
888 288 9080

8305 HIGHWAY 71 WEST AUSTIN TEXAS 78735 UNITED STATES
TELEPHONE: 512 288 9080 WEBSITE: [HTTP://WWW.RINGDALE.COM](http://WWW.RINGDALE.COM)

New Version!

**Is your
network management software
something less than best of
breed?**

**Seagate Desktop Management Suite™ gives you a mix that's
tops in its class.**

Seagate Software offers you a comprehensive suite of best of breed Windows NT and NetWare based management utilities.

Inventory - Seagate WinLAND provides NOS independent collection and reporting of hardware and software inventory with e-mail and SNMP tracking alerts

Software Distribution - Seagate WinINSTALL boasts award winning 32-bit technology that makes it easy to distribute complex applications & updates without writing scripts

Now! **Metering** - Seagate WinSMART's point of execution metering lets you monitor & control application usage throughout your enterprise

Backup - Seagate Backup Exec is the industry standard, 100% compatible backup solution for the complete Windows NT environment

Remote Control - View and control workstations and file servers from anywhere with TCP/IP & IPX protocols

All integrated and administered from a single console, to dramatically reduce the resources needed to effectively run your business. Add on Virus Control and put some real teeth into your plans for improving network efficiency.



www.seagatesoftware.com
CALL FOR A FREE PROMOTIONAL
CD-ROM WITH
FULL FUNCTIONING DMS TRIAL
1-800-729-7894



"Editor's Choice"
PC Professional
GERMANY



Seagate Software

©1997 Seagate Software, Inc. Seagate Desktop Management Suite, Seagate Software and the Seagate logo are trademarks of Seagate Technology. All other trademarks are the property of their respective owners. Outside of the U.S. and Canada call 1-800-729-7894.

CIRCLE 871 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

**grab a
great suite**

NETWORK EDITION

COVER STORY



TOTALLY IN CONTROL: Total Control Manager helps you configure the unit's modems.

the number of modem cards you're using: Each card has four internal modems, so you need 12 modem cards to provide 48 analog connections. Though there is room for another dual-T1 module in the chassis, there isn't enough room to install the extra modem cards. If you're using POTS connections, you can have up to 64

analog connections in a single unit by using the RJ-11 ports on the back of each analog modem card. By the time you read this, 3Com should be shipping new DSP modem and router cards that allow a fully loaded chassis to support 336 sessions.

Although not the easiest product to install, the Total Control Hub provides a graphical configuration utility called Total Control Manager. You can use this utility to set up all of your NACs, and unlike most other management utilities, it even lets you change the settings, such as the baud rate, for individual modems. But before you can use Total Control Manager, you must connect to the NMC via a terminal and enter basic information such as the unit's IP address.

Total Control Manager also provides more information—as on flow control and baud-rate changes—than most administrators will probably ever really

need. Additionally, you can use Total Control Manager to set up security information such as callbacks and passwords, as well as user names.

Last, the Total Control Hub offers a choice of two remote-access servers—the EdgeServer, which is basically a PC on a

card that runs Windows NT RAS, and the NETServer, which is a dedicated turnkey router. We looked at a NETServer configured to handle up to 48 analog or 46 digital calls. For installing the NETServer, you need to connect a serial cable between your own PC and the NETServer and then use either a terminal emulation utility or the graphical NET-

Starter start-up wizard.—SR

Total Control Enterprise Network Hub. List price: Tested configuration, \$38,636. 3Com Corp., Santa Clara, CA; 408-764-5000; fax, 408-764-5001; www.3com.com. Circle 954 on reader service card. □

SUITABILITY TO TASK

Total Control Enterprise Network Hub

Cost of ownership	Fair
Management and security	Good
Performance and scalability	Poor
Installation and configuration	Good

Network Edition Advertisers Index

Reader Service No.	Advertiser Telephone / Web Address	Page
927	Accton Technology	NE35
915	American Power Conversion 800-800-7272 / http://www.apcc.com	NE9-NE11
934	Axis Communications, Inc..... 800-444-AXIS / http://www.axisinc.com	NE16
*	Compaq Computer Corporation..... 800-345-1518 / http://www.compaq.com	NE2-NE3
889	Deltec	NE31
	800-426-2448 / http://www.deltec.com	
*	Hewlett Packard SureStore	NE7
	800-249-4057 Dept. 465 / http://www.hp.com/storage	
855	Micro Solutions	330

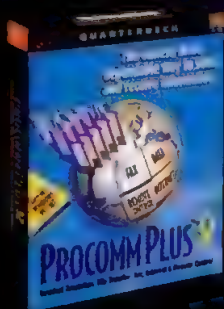
Reader Service No.	Advertiser Telephone / Web Address	Page
884	QMS	NE33
	800-841-0754 / http://www.qms.com/	
880	Quarterdeck Office Systems	NE15
	800-683-6696 / http://www.quarterdeck.com	
*	Ringdale UK LTD	NE12
	http://www.ringdale.com/	
871	Seagate Software	NE13
	800-525-5645 / http://www.nsmg.seagate.com	
070	Trend Micro.....	NE5
	800-228-5651 / http://222.trendmicro.com	
*	US Robotics, Inc.	NE19-NE29
	800-DIAL-USR / http://www.usr.com	

*No Reader Service#. Please Call Advertiser for Information.

For Network Edition information, use Reader Service Card located in the back of the book.



GREAT LINES OF COMMUNICATIONS WILL
OPEN UP FOR YOU AND EVERYONE AROUND YOU.



HOW FORTUNATE. PROCOMM PLUS[®]32 GIVES YOU RELIABLE, EASY WAYS TO SEND AND RECEIVE INFORMATION SO YOU CAN GET THROUGH THE DAY WITHOUT A HITCH. IT SUPPORTS 36 TERMINAL EMULATIONS, 11 FILE TRANSFER PROTOCOLS, AS WELL AS REMOTE CONTROL, FAXING AND ACCESS TO THE INTERNET WITH TELNET, FTP AND A WEB BROWSER. AND, WITH ADVANCED COMMUNICATIONS SCRIPTING CAPABILITIES, YOU'VE GOT FULL TASK AUTOMATION TO BOOT. SO EVERYONE'S HAPPY, YOU LOOK GOOD, AND WHO KNOWS? MAYBE THE ONE ABOUT FAME AND PROSPERITY WILL COME TRUE TOO. FOR MORE INFORMATION ABOUT HOW PROCOMM PLUS 32 CAN STREAMLINE YOUR COMMUNICATIONS, VISIT OUR WEB SITE AT WWW.QUARTERDECK.COM OR CALL 1-800-282-0866 AND MENTION CODE #01722.

PROCOMM PLUS³²
FOR WINDOWS NT/95

© 1997 Quarterdeck Corporation. All rights reserved. All brands and product names are trademarks of their respective holders.

CIRCLE 880 ON READER SERVICE CARD

NOW YOU CAN NETWORK ALL THAT JAZ™



INTRODUCING UP TO 4 GIGS IN A PLUG-AND-PLAY TOWER.



*The Jaz drives are by Iomega.
The plug-and-play
network tower is by
Axis Communications.
Share your stuff!*



Millions of PC users are storing their stuff on Iomega® Jaz™ drives.

With a gigabyte per cartridge, there is plenty of room to store and organize everyone's stuff.

Now you can take your gigs to the network. Introducing

AXIS StorPoint HD/4 Jaz™ from Axis Communications. It's a plug-and-play tower with four Jaz drives that connects directly to the network. So you get instant access to all that Jaz stuff across your enterprise.

There's no file server or extra workstation needed, and no special software to buy.

What is ThinServer Technology?

It's a breakthrough technology that makes peripherals of all kinds "network-ready."

WE ARE REVOLUTIONIZING WITH THINSERVER TECHNOLOGY

Access everything from printers and storage systems to digital cameras and CD-ROM drives —

with no intermediate

PC client or server. Your peripherals

work faster and smarter.

Everything is plug and play!

The AXIS StorPoint HD/4 Jaz installs in minutes and includes full Windows 95 and NT support. It also acts as a Web server so you can access the Jaz drives from a standard Web browser. It's ideal for workgroup sharing, network storage backup, archiving and much more.

The AXIS StorPoint HD/4 Jaz is the latest in a complete line of ThinServer™ Technology products from Axis Communications that are revolutionizing the way peripherals connect to the network.

Visit our Web site at www.axis.com, or call us today at 800-444-AXIS* and get all the details. Because this gig is ready to play on the network!



Axis is a registered trademark, and AXIS StorPoint HD/4 Jaz and ThinServer are trademarks of Axis Communications AB. Iomega is a registered trademark and Jaz is a trademark of Iomega Corporation. All other company names and products are trademarks or registered trademarks of their respective companies.

* GSA pricing available. Call for more information.

CIRCLE 834 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

First Looks

HANDS-ON REVIEWS OF NEW SHIPPING PRODUCTS

TELEPHONY HARDWARE

Your Personal Digital Operator

By Les Freed

If you work at home, you have access to much of the same technology as your office-bound counterparts—with one major exception. You don't have a full-time secretary or receptionist to answer and screen incoming calls, locate colleagues when you're out of the office, or take a message when you don't want to be disturbed. Jetstream Communications has helped solve this problem with its \$1,395 Front Desk, an ISDN-based phone system that puts you in control of your incoming calls, no matter where you are. The Front Desk provides big-office phone features, such as built-in digital voice mail, intelligent call forwarding, distinctive ringing, call screening, conference calling, and incoming fax storage. It also offers first-rate ISDN data service for your PC as part of the bargain.

The Front Desk consists of two units. A laptop-size main unit called the Front Desk Hub hides behind your PC or under your desk and connects to the ISDN line, to your phones, and to AC power. A small display/control unit called the Front Desk Display sits on your desktop and displays the date, time, and caller ID information, and it also acts as your interface with the unit's voice-mail, call-screening, and call-forwarding functions. The Hub unit includes a built-in battery

backup system that can run the Front Desk without AC power for up to 4 hours.

Installing the Front Desk is very simple. You connect your ISDN line, telephones, and fax machine to the Hub with standard phone cables, and you use the provided serial cable to connect the Front Desk to your PC. It's important to note that the Front Desk requires a PC for installation and configuration duties, but the system op-

line or configuration changes for you at no charge.

Once you've plugged in the cables and installed the Front Desk software on your PC, you use Front Desk Manager to handle incoming calls on each phone number. The Manager program lets you create rule sets called Office Modes for various incoming numbers. You can customize the Office Modes to suit your needs, and you can switch sets from the

phone on incoming calls and takes a message if no one answers within four rings. Our Out of Office mode set answers on the first ring and offers the caller the option to page, transfer the call to a cellular phone, or leave a voice mail message. Incoming calls to the third phone number automatically go to the fax machine no matter what mode we've selected.

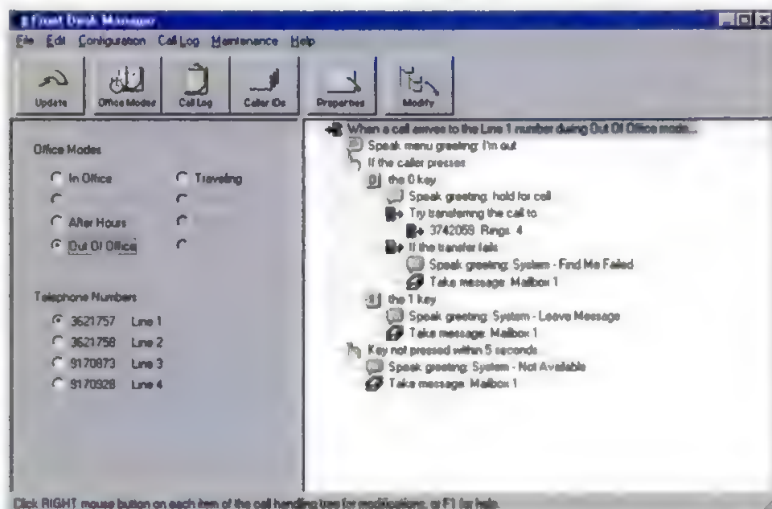
You can also program the Front Desk to take special action based on caller ID information. For example, we programmed the Front Desk to forward to our cellular phone automatically any time an edi-

tor calls. Fast call setup is one of ISDN's major benefits, and calls transfer through the Front Desk almost instantly. ISDN call transfers are performed by the phone company's central office, so transferred calls don't tie up your ISDN line.

The Front Desk also includes a full-featured ISDN terminal adapter, so you can use the Front Desk to place ISDN data calls to your home office router or to an ISP. The Front Desk appears as an additional modem device in Windows 95's Dial-Up Net-

working, so you can use it with any LAN protocol installed on your PC. We tested the Front Desk by calling into routers from Ascend, Cisco, and Shiva without any interoperability problems.

Front Desk. List price: \$1,395. Jetstream Communications Inc., San Jose, CA; 408-777-4331; fax, 408-342-8505; www.jetstream.com. Circle 955 on reader service card.



CONNECTIONS MADE EASY: The Front Desk provides users an easy-to-use graphical interface to configure the unit.

erates independently. The PC doesn't need to be powered on (or even present) for the Front Desk's day-to-day operation. For optimum flexibility, the Front Desk requires that your ISDN line be configured with four phone numbers, although it will work with lines configured with two numbers. Most phone companies don't charge for the additional numbers, and Jetstream can order the ISDN

display unit or remotely over the phone.

On our tests, we connected a two-line analog phone to ports 1 and 2 of the Front Desk and an analog fax machine to port 3. Incoming calls to the first ISDN phone number ring with a normal ring on line 1 of the phone, and incoming calls to the second number ring with two short rings on line 2. Our In Office mode set simply rings the

NETWORK BACKUP SOFTWARE

Replica's Data Mirror

By Steve Rigney

Just because you have a good backup doesn't mean you won't lose valuable time and money if something goes wrong. If your Windows NT file server's hard disk crashes, you usually have to find a replacement disk, reinstall the OS, find your backup software and reinstall it, and then restore your data from tape. This can take an entire day if you don't have everything you need. But with Stac Electronics' Replica for Windows NT Single Server Edition (\$499 list, or free from www.stac.com, minus disaster-recovery capabilities), you can keep downtime to a minimum.

Replica provides excellent disaster recovery, lets you mount your backup medium as

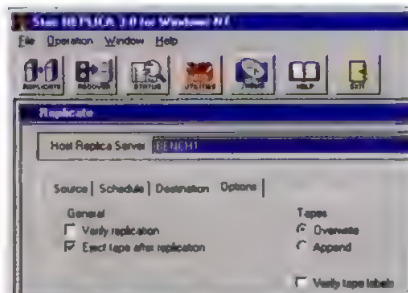
In the truest sense, Replica is not a network backup application. Most network backup or storage management programs, such as Cheyenne's ARCserve or Seagate's Backup Exec, copy data from the server to a tape device on a file-by-file basis. Though this approach is flexible, it is also slow. Replica operates at the logical-volume level: It replicates the entire volume to tape and copies each block sequentially. Unlike file-by-file copying, Replica's Object Replication Technology doesn't open individual files during a backup, so you can safely replicate files that are in use. You can back up your Web, e-mail, and file servers without missing any data or forcing the users to log off. Replica's technology, however,

doesn't let you replicate individual files or perform incremental backups of changed data.

Since Replica creates a complete mirror image of your Windows NT server's volumes, you don't need special client software to restore data. In fact, you can mount the

tape as a volume in the event of a failure. On our tests, we dismounted a Windows NT volume on the server and then mounted the backup tape. We were able to go to any client PC, connect to the server, and map a drive to the tape to restore our files. Accessing a tape as a volume is slower than accessing a hard disk, but it is a great disaster-recovery feature that other backup products don't provide.

The disaster-recovery option is our favorite Replica feature. To use it, you must create a set of disaster-recovery floppy disks. Replica uses your Windows NT setup disks to create a set of four bootable floppy disks that let



BESIDES PROVIDING backup, Replica offers such useful options as tape ejection.

a volume, offers unattended replication, and replicates files even when they are in use. But the product doesn't provide agents to back up client PCs; it backs up only a single server, doesn't include tape rotation schemes, and doesn't back up individual files or directories. Replica Intranetwork Edition for Windows NT, which should be available by the time you read this, will let you back up multiple servers to a single PC running Replica. The Intranetwork version should also include a centralized management utility for monitoring and creating jobs on all of your Replica servers.

CROSSTALK



Frank Derfler

“Leon, the folks at Jetstream Communications really know how to squeeze all the value from an ISDN link. Front Desk's ISDN signaling tricks can route calls more quickly and with more logic than many expensive PBX systems. This product really makes a small office work like a mega-enterprise. Personally, I highly highly recommend it.”

“Strong praise, Frank. The Front Desk is one of several new innovative telephony products. I like the Be There! system from Data Race. This product extends your company's PBX to wherever you happen to be. You get full PBX functions, such as call forwarding and four-digit dialing from a hotel room or airport, and you have a connection to the corporate LAN. Great telephone stuff!”



Leon Erlanger

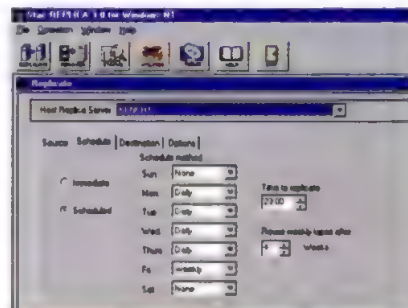
you boot up a failed Windows NT PC, mount the volume on the tape, and recover all your files in a matter of minutes. The only other product we know that offers a disaster-recovery option for Windows NT is ARCserve. But ARCserve's option is \$395 and requires you to have your Windows NT CD-ROM and create a special disaster-recovery tape.

Replica's Internet Control Center is a built-in Web browser that's designed to connect automatically to Stac's Web site and watch for product updates and information. You can schedule the Control Center to connect periodically to look for new information. Though you can use any Web browser, the Control Center automatically sends your registration information so you don't have to type it in every time you connect.

All of Replica's backup and recovery operations are performed from a single Windows-based graphical utility. This utility is extremely easy to use, and even a novice shouldn't have a problem starting a replication. You can use Replica to schedule any unattended backups on a daily or a weekly basis. You

can also perform other tasks, such as ejecting the tape after a backup and verifying the data on the tape. Replica also keeps detailed log files of all your replications and recoveries. You can view the text-based logs on-screen or print them out.

If you need to back up your client PCs, keep tapes off-site (using a tape rotation scheme), or back up multiple servers to a single device, you should consider another product such as ARCserve or Backup Exec. Replica, however, is one of the easiest and least expensive storage management solutions for Windows NT on the market. And it provides some of the best disaster-recovery technology. **Replica for Windows NT Single Server Edition.** List price: \$499. Stac Electronics Inc., San Diego; 619-794-4300; fax, 619-794-4570; www.stac.com. Circle 956 on reader service card.



LIKE MOST WINDOWS NT utilities, Replica lets you create your own backup schedule.

GET REAL.

GET THE REAL STORY
RIGHT NOW.

ONLY x2[™] Technology has been deployed in over 100 networks worldwide.

GET a free upgrade to the ITU-T 56K standard*

CHECK OUT more info at www.usr.com/real

Get the x2 Product Catalog that was here



Call 1-800-877-7533, ext. 6734

GET REAL INFO
RIGHT HERE

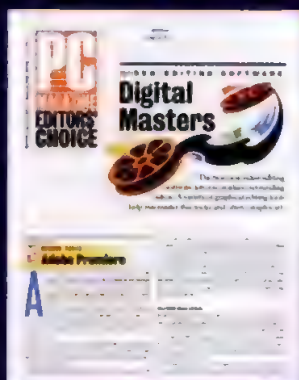
1-800-877-7533, ext 6734

From the leader in networking.

3Com



A GREAT REVIEW IS WORTH REPEATING



REPRINTS

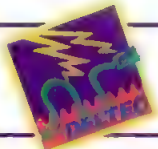
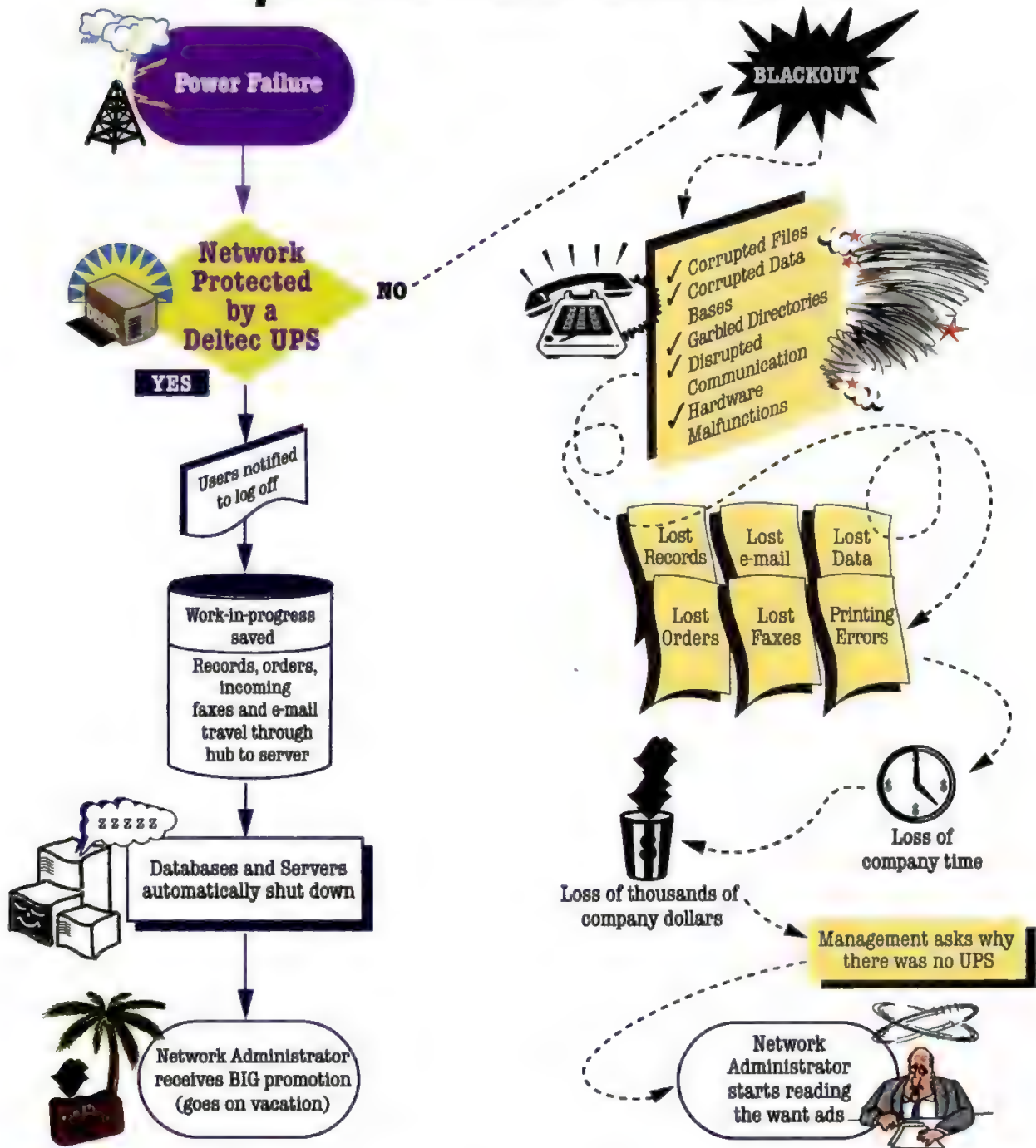
No marketing tool has more impact than a great product review in PC Magazine. Buyers know they can base their buying decisions on PC Magazine reviews because our labs, writers and editors can be trusted to be thorough, fair and impartial in their testing and reporting. Get the most value out of your review with reprints. Hand them out at a trade show. Send them to your mailing list. Provide them to distributors. Add them to a press release or a mailing to your stockholders. Ziff-Davis reprints make it simple and affordable. And if you cus-



tomize your reprint the value increases even more. Call Ziff-Davis Reprints today at **800-825-4237.**

What a difference a UPS makes...

Improve the flow with Deltec.



CALL NOW
1-800-DELTEC-1

Win prizes at our Web site
<http://www.deltecpower.com>
or e-mail: info@deltecpower.com

DELTEC



.....Play to **win**
and **save** yourself
some **money**....



Make the ultimate move for serious gamers who know the score when it comes to buying computer gaming magazines. Subscribe to Computer Gaming World now and save up to 47%!

Every monthly issue brings you exclusive first looks at the hottest, newest games... the latest in multimedia, CD-ROM and interactive environments. Plus winning strategies, master clues, in-depth reviews – all the help you need to pump up your system and play out your fantasies on this planet and beyond.

Score points and cosmic savings now with Computer Gaming World. We're worlds apart from any other computer game magazine.

- One year/12 issues – \$27.94.
YOU SAVE 41%!
- Two years/24 issues – \$49.97.
YOU SAVE 47%!

Savings based on annual cover price of \$47.40.

CALL NOW TO SAVE UP TO 47%
1-800-827-4450

To ensure savings, mention this code to the operator who answers your call: 4Z95.

Plug. Play. Perform.

QMS WX Print Systems — Optimized Printing for Windows NT & 95

QMS® 2060 WX Laser Printer



This 20 ppm laser printer has a versatile feature set for PC users.

Attach the QMS 2060 WX

through the standard Ethernet or parallel interface to make the connection to a host of powerful options. Designed for use with Windows NT 4.0 and 95, the QMS 2060 WX is an affordable, industrious workgroup printing solution.

- 600 x 600 dpi
- Standard Ethernet interface
- Up to 13" x 19" page sizes
- Broad media support
- Duplexing option
- Plug and play compatible

QMS *magicolor*® WX Laser Printer

Add brilliant color to business documents or print image-rich



Web pages with the QMS *magicolor*

WX. Unlike typical ink jet printers, the QMS *magicolor* WX can handle the demands of a busy Windows workgroup easily and inexpensively.

- 600 x 600 dpi
- 3 to 6 ppm color, up to 12 ppm monochrome
- Plug and play compatible
- High monthly duty cycle
- No special paper required
- Designed for Windows NT 4.0 & 95



MICROSOFT
WINDOWS
READY TO RUN

1-800-523-2696

Ext. 83

<http://www.qms.com>



One Magnum Pass • Mobile AL 36618

CIRCLE 884 ON READER SERVICE CARD
OR GO TO WWW.PCMAG.COM/ProductLink

Extend the power of Windows with printers that mean business. Designed to take full advantage of the printing features and capabilities of Windows NT and 95, the plug and play compatible QMS WX printers offer high-performance processing for all your Windows® desktop applications.

The QMS 2060 WX is the ultimate on-demand print system for Windows workgroups. It combines a standard Ethernet® connection, duplexing capabilities, broad paper handling, and fast print speeds to give users flexibility and performance.

With the QMS *magicolor*® WX Laser Printer, workgroups can create, express, and emphasize with color. The power of this printer makes it easy to produce effective, colorful business documentation. Both QMS WX printers play to your bottom line with a low, affordable price tag.

Open your Windows applications to high-performance printing with the Windows-optimized QMS WX print systems.

©1997 QMS, Inc. QMS, the QMS logo, and *magicolor* are registered trademarks of QMS, Inc. All other trademarks are the property of their respective companies.

BOOKMARK The Benchmark.

NEWSWATCH

WHAT'S HAPPENING TODAY, AND WHAT IT MEANS — ALONG WITH UP-TO-THE-MINUTE NEWS STREAMED FROM THE INDUSTRY PRESS.

INSITES

HARD-HITTING OPINIONS, AND SAVVY WEB INSIGHTS FROM MICHAEL J. MILLER (EDITOR-IN-CHIEF), DON WILLMOTT (EXECUTIVE EDITOR, ONLINE), PLUS "NEWS, VIEWS AND SNIDE ASIDES" FROM JOHN C. DVORAK.

InternetUser

THE MOST COMPLETE AND CURRENT GUIDE TO INTERNET SOFTWARE AND TOOLS — AN INDISPENSABLE RESOURCE FOR ANY SERIOUS NETIZEN.

PCLABS Online

ALL THE GOOD STUFF YOU EXPECT FROM PC LABS, WITH INTERACTIVE FEATURES THAT MAKE IT EVEN EASIER TO DRILL DOWN TO THE INFORMATION YOU NEED.

EDITORS' CHOICES

YOUR LINK TO THE BEST OF THE BEST PRODUCTS IN EVERY CATEGORY.

Every day you'll find timely, comprehensive and labs-based reviews of the latest products and technologies.

PC Magazine Online, your most valuable bookmark.

www.pcmag.com



**BOOKMARK
The Benchmark.**



IT'S VERY WELL
MADE IN TAIWAN

The Winning Product
EH2005-TX

Accelerate your network with Accton's Ethernet Switches, Hubs, and Cards

You want Accton's fast solution for your network, and it comes with the combination of our Ethernet and Fast Ethernet Switches, Hubs, and Cards.

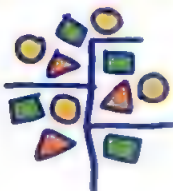
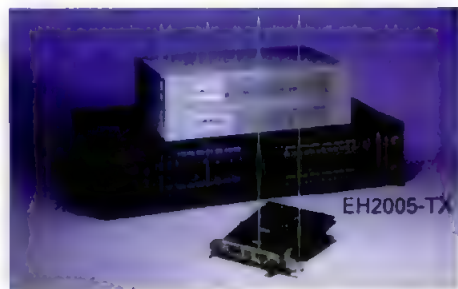
Accton has designed a solution built from the ground up to meet the networking needs of growing companies like yours. You get speed, ease-of-use and flexibility, all at a surprisingly low cost.

Our cards feature Accton's patented MPX technology and come in a full range of plug-and-play adapters for PCI, ISA, and PCMCIA. When combined with Accton's comprehensive line of Ethernet and Fast Ethernet switches, they can deliver full-duplex support, doubling your existing bandwidth.

Our stackable hubs provide fault-tolerant capabilities, stack-and-play capabilities, as well as their unique multi-segment architecture.

To learn more about Accton's solutions for your networking demands, visit our website at:

<http://www.accton.com>



Accton Technology Corporation

International Headquarters No. 1 Creation Rd. III, Science-based Industrial Park,

Hsinchu 300, Taiwan R. O. C.

Phone: 886-3-577-0270 Fax: 886-3-577-5541 577-0267

Accton

Making Partnership Work

CIRCLE 927 ON READER SERVICE CARD

Get 12 Issues Of FamilyPC For Just 12 Bucks.

(And The First Issue Is On Us!)

FREE ISSUE OFFER!



Fun. Smart. Exciting. That may not sound like your typical "computer" magazine. But, then again, we're far from typical. We're FamilyPC. The fun computer magazine from the folks at Disney and Ziff-Davis! FamilyPC is for the entire family. With straight-forward stories and articles, we cut through the hype to help your family make smart decisions about buying and using computers, online services, games and software.

HERE'S WHAT YOU'LL FIND IN EACH ISSUE!

Family-Tested Reviews Which computer products are worth your cash? Our team of parents, kids and teachers delivers the inside scoop!

Deals & Discounts Learn when and where to buy. How to get free upgrades, free software, and other "hidden" discounts. Plus, our bargain hunters scout out the top values in both retail and mail-order.

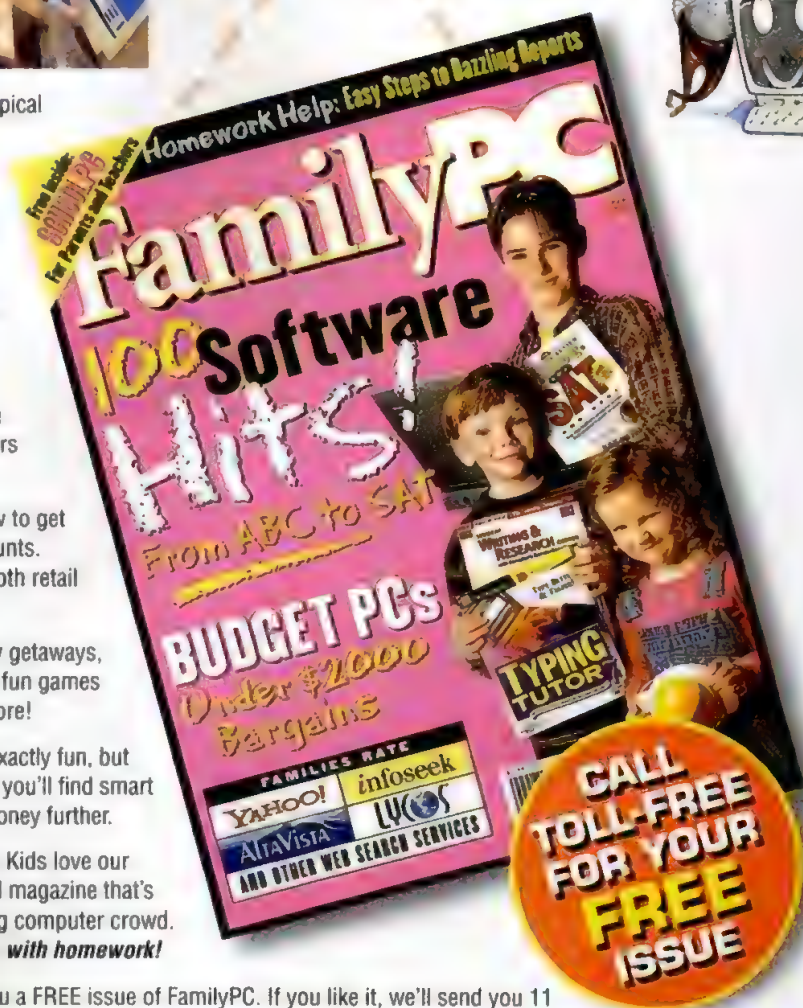
Fun! Fun! Fun! From planning parties to finding family getaways, we're loaded with super ideas and helpful hints. Plus – fun games that help kids learn. Easy-to-do family projects. And more!

Hot Money Tips Balancing the family budget is never exactly fun, but with FamilyPC, it can sure be a lot easier. In each issue, you'll find smart tips and easy-to-follow strategies for stretching your money further.

Plus, A Cool Magazine Just For Kids Kids love our "Megazine" – a kids-only, kids-created magazine that's plugged into what's hot with the young computer crowd. **Plus – games, tips, tricks, even help with homework!**

Interested? Call now. We'll send you a FREE issue of FamilyPC. If you like it, we'll send you 11 more (12 in all) for just \$12. Your family will save 67% off the annual cover price.

If you decide not to get the 11 issues, just write "cancel" on your bill and owe nothing. The first issue is yours to keep either way.



1-800-888-9688

Data, voice and video is now at networking's core.

Computer Telephony • Videoconferencing • Internet Telephony



October 6-10, 1997 • Atlanta, Georgia

NetWorld+Interop, where networking standards are set, presents: CommUnity.

For over 10 years, NetWorld+Interop has been the source for new technology, new ideas and trendspotting for the networking and Internet industry. Continuing that tradition this fall, NetWorld+Interop embraces the convergence of data, voice and video with the CommUnity Conference and Exhibition. From in-depth technical sessions and workshops, to focused courses for both VARs and Systems Integrators, CommUnity provides the strategic and tactical know-how to effectively create and deploy

cutting-edge integrated applications across your enterprise. In addition, there will be a dedicated exhibition area demonstrating these vital applications. Joining NetWorld+Interop's General Conference, Security Symposium, Workshops and Tutorials, CommUnity examines data, voice and video as they were meant to be—one solution. If you're developing and deploying integrated data, voice and video, don't miss out on CommUnity at NetWorld+Interop Atlanta. Register today.

Atlanta, Georgia
Georgia World Congress Center
October 6-10, 1997

For Registration/Information:

1-800-962-6513

Int'l 415-375-7070

www.interop.com

SOFTBANKforums

**NETWORLD
+ INTEROP**

The AMD-K6™ MMX™ Enhanced Processor.

It's the new generation of



SATURN KID.JPG

File Edit View Image Colors Masks Selections Capture Window Help



amd@work

chip technology.



The AMD-K6™ MMX™ Enhanced Processor

for a new
generation of
human achievements.

What a child sees and hears feeds his imagination. Now you can give your child a feast of sights and sounds unlike any before. The AMD-K6™ MMX™ Enhanced Processor delivers a new generation of multi-media sound, video, color and graphics. It's also amazingly fast and affordable. Which makes it a smarter choice than the Pentium® II processor for running Microsoft Windows®-based PCs. Of course that's the kind of achievement you'd expect from a company that's shipped over 50 million processors in just the past five years. Now, think what your child, and you, can achieve. Visit our website.

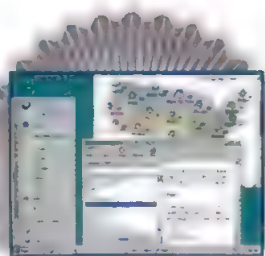
AMD

www.amd.com

CIRCLE 079 ON READER SERVICE CARD

© 1997 Advanced Micro Devices, Inc. AMD, the AMD logo, AMD-K6, and the AMD-K6 logo are trademarks of Advanced Micro Devices, Inc. Microsoft and Windows are registered trademarks of the Microsoft Corporation. MMX is a trademark, and Pentium is a registered trademark of the Intel Corporation. For more info call 1-800-222-8823. For technical support call 408-749-3000.

Your Person



Windows 98: Memphis & IE 4.0

Here's our first look at Microsoft's new Web desktop, with a preview of the next version of Windows (code-named Memphis). We cover it all, from interface changes to evolutions in architecture105



Webcasting vs. Netcasting: The Browser Push Is On

Many in the Web community have already cast a solid yes vote for push. Here's the best testimony to its growing popularity: Microsoft and Netscape are facing off with competing solutions123



Recommendation Systems: Advice from the Web

Web sites offering personalized recommendations are among the hottest ones. And why not? Besides being a time-saver, this technology is fun—and future uses may prove it to be really productive133



Internet Security: Protection at the Desktop

More personalized use of the Web means more risk. But the market for self-protection is burgeoning. Here are three product sets149
Personal Security Suites151
Cookie Managers159
Secure E-Mail171

al Internet

The Web has morphed from a novelty to a resource that we rely on every day. New tools and technology are fueling this phenomenon, making the Web more personalized as well as safer and faster.

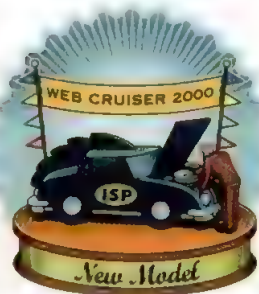
By Gail Shaffer



Chat Software: Talk of the Internet
A good way to build community, chat packages use the Web's pervasive reach to keep us in touch181



Internet Service Providers: More Speed in the Pipeline
The need for bandwidth—a stumbling block to more creative, personal Web use—will only increase as more users go online. Internet service providers are in even fiercer competition197



Special Section: Choosing Your ISP
Having trouble figuring out which Internet service provider to go with? We've put together several ideas to help you choose the right ISP for your needs.....205

As millions of us have taken to the Web over the past few years, we've nudged it in directions that help us in our pursuits, both professional and personal. It's quickly become invaluable, letting us get information instantaneously and act in real time.

The more we rely on the Web, the more we demand from it. We want it to cater to our needs by sifting through mountains of data and delivering only what we desire. We want it to make finding and communicating with like-minded people easier. And we want it to be safe, fast, and reliable.

In this issue, we look at new products and services that address all these areas, including the new Microsoft Internet Explorer release and a preview of the new Windows OS, code-named Memphis. We also look at how push technology is integrated into the newest browsers.

GETTING TOGETHER

The Web isn't just a library of information; it's a community. Two technologies that help establish this atmosphere are recommendation systems and chat.

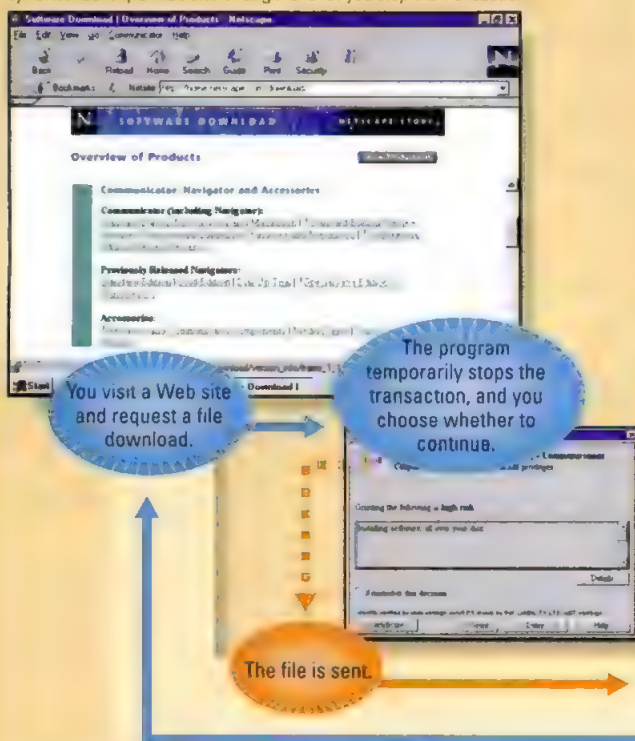
Recommendation systems represent a new twist on an old notion—that people with common interests have a lot to offer one another. Many sites are adopting this technology to offer recommendations based on your personal interests, and thou-

www.pcmag.com

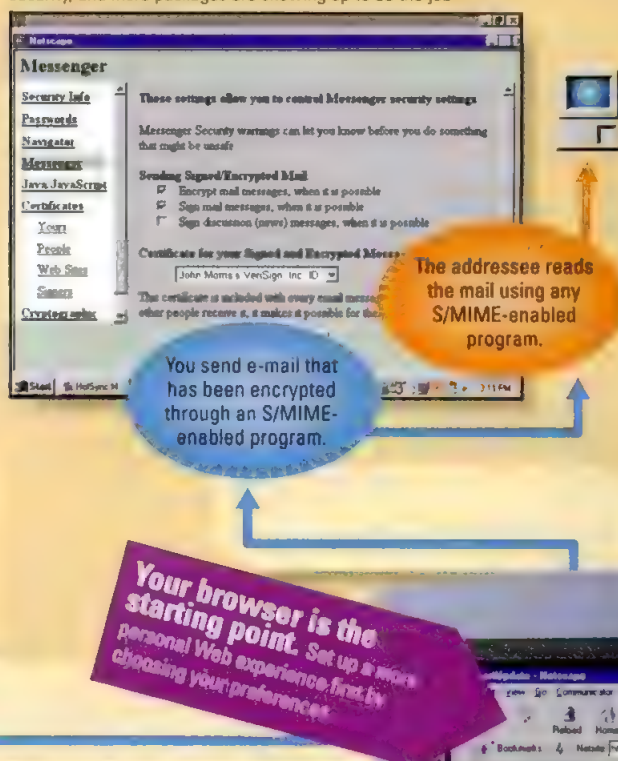
We have extended coverage of chat servers, recommendation systems, and Internet service providers online. And from August 18 to 22, join our discussion: Is your ISP a saint or a sinner?

Behind the Scenes: The Web Gets Personal

File Download This popular Web activity can expose you to viruses, though you can use virus protection. New personal security suites identify a file's site of origin and let you stop the transaction



Encrypted E-Mail Using e-mail remains the most popular online activity. Business use of the Web calls for better security, and more packages are showing up to do the job



Your browser is the starting point. Set up a more personal Web experience first by choosing your preferences.

Ten Steps to Protecting Your Data and Your Privacy Online

1. Use the latest version of Microsoft Internet Explorer or Netscape Navigator
2. Decrease the size of your browser's cache file and clear its contents often
3. Reduce the number of days that links are kept in your history folder and clear its contents often
4. Get a digital certificate, which will identify you to Web servers and make it really difficult for anyone to impersonate you
5. Set your browser to watch out for cookies
6. Do not download software unless it is signed by Authenticode. This so-called trust model provides some security
7. Keep your global safety settings set to maximum
8. Choose passwords that are tough to crack
9. Try a shareware utility that stores passwords for you such as PassKeeper. You'll find several choices at www.zdnet.com
10. Set your screen saver to use a password!

sands of people contribute to sites built on so-called collaborative-filtering engines. We assess four recommendation systems, each with its own twist.

Chat software is a good choice for Web site creators who want to promote a sense of community. A Web site can be a place to chat spontaneously with folks several states or countries away. Chat packages are also finding fans among managers of corporate intranets who are seeking to

foster real-time collaboration online.

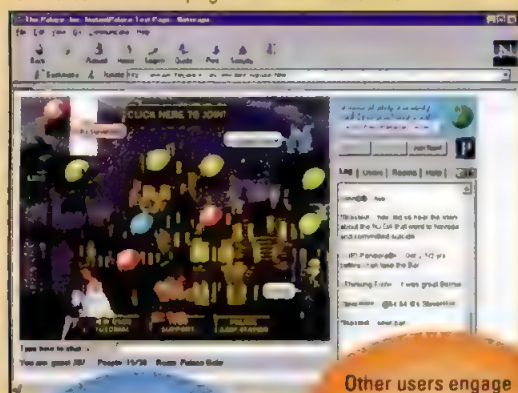
Technologies like recommendation systems and chat can't work unless we're willing to share some information about ourselves. In the process, we expose ourselves to potential security threats. But new software lets us minimize dangers to our data and our privacy. We review three sets of such products: security suites, cookie managers, and S/MIME e-mail clients.

Personal security suites are a new cate-

gory. More comprehensive than antivirus programs, the three packages we review each offer a suite of utilities for protecting your system, especially from malicious ActiveX controls and Java applets that you may download.

Cookies are important bit players in the personalization of the Web. These text strings that go from the Web to your system allow sites to recognize you and to serve up personalized information. Already used

Chat It's changed the online experience for good. You engage in real-time online conversations with anyone who joins in the same session. Chat helps grow communities online.



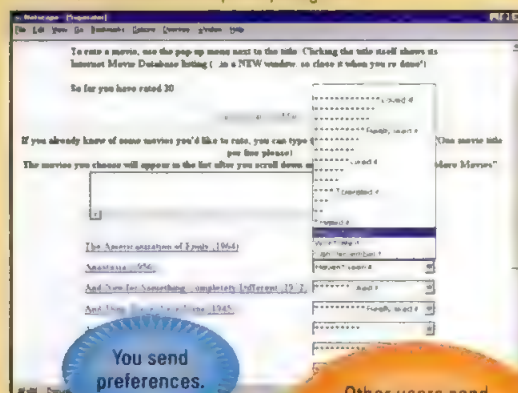
You send instant messages.

Other users engage in real-time chat with you through a chat server.

You receive instant messages.



Recommendation Systems Thousands of users send their preferences to sites that collect the information and return recommendations to participating users.



You send preferences.

Other users send preferences, adding to the experience database.

You receive recommendations.



Cookie manager blocks cookies

Cookies.

Ten Ways to Make the Web a More Personal Experience

- 1. Create a personal home page.** Use Excite, My Yahoo!, or another Web site that uses your preferences to create a home page.
- 2. Download The Palace** and put a face on your online identity with a custom avatar for visiting its many rooms.
- 3. Use Internet Explorer 4.0 or Communicator** to make a toolbar of bookmarks that you can access easily.
- 4. Turn any Web site** into a venue for chat with Virtual Places, software that enables online tours.
- 5. Use Netscape Communicator**, which lets multiple users set up individual profiles for their own bookmarks and views.
- 6. Customize the channels** you receive to view Web content offline with Microsoft Active Desktop and Netscape Netcaster.
- 7. Check out Moviefinder.com**, a Net Perceptions application that not only recommends movies based on your ratings of films but also tells you if the pictures will be on TV in your area.
- 8. Sign up for a free** browser-based e-mail service such as Hotmail or MailCity. Your e-mail will be accessible from anywhere.
- 9. Find a flick** with Movie Critic and Movie Matcher.
- 10. Sift through the infoglut** with a combination of recommendation systems and neural network applications at WiseWire.com.

widely in applications such as online shopping carts, cookies are likely to become building blocks for Web commerce. But many of us don't like the idea that someone is depositing anything on our hard disks, never mind what information the cookie might store. Cookie managers let you control which go and which stay. Note that if you block cookies entirely, though, you won't enjoy as rich an experience as users who allow cookies.

E-mail is the leading activity on the Internet, and S/MIME addresses the need for universally secure mail. Like any fledgling standard still in transition from proprietary status, it is neither well implemented nor in wide use yet. But it's on the right track. In this issue, we cover six e-mail clients that offer some kind of S/MIME support.

Finally, the most tangible technical challenge to widespread Internet usage is

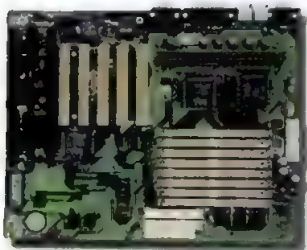
the need for bandwidth. Most of those just venturing online still live in a 14.4-Kbps or 28.8-Kbps world. That's just not enough, long-term. To see what's being done about it, we assess some of the biggest U.S. Internet service providers.

Only a few years ago, new technologies—such as advanced browsers—were what fueled the growth of the Web. Nowadays, the Web's allure and potential drive new tools and technologies. □

“Advanced Micro Devices Inc. Can lay claim to having the fastest shipping X86 processor today with its K6, but when the Pentium II arrives next month, Intel Corp. will reclaim the lead.”

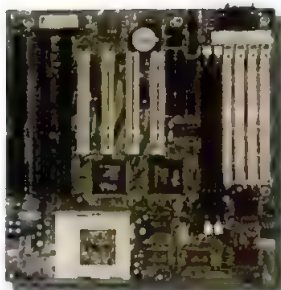
PCWEEK APRIL 7, 1997

**It is a good thing that you can rely on
Spacewalker Motherboards
to keep up with the rapid changes in
advanced chip technology.**



Hot-623

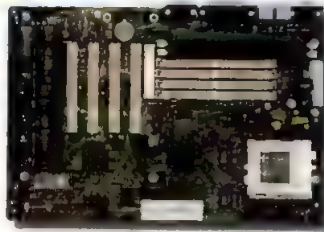
The Best Pentium II Motherboard



Hot-555A

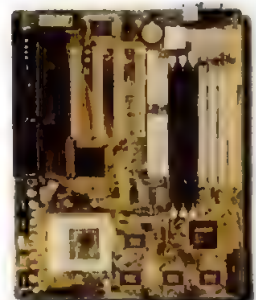
**The Most Acclaimed Intel VX
Chipset Motherboard**

7/97 Editor's Choice
PC-Direkt-7/97
German Edition



Hot-567

The Latest Intel TX Chipset Motherboard



Hot-571

The Latest Intel TX Chipset Motherboard

- MMX Technology
- Supports Pentium II Processors Up To 300 MHz
- 8 SIMM Sockets
- Supports Up To 1 GB (ECC)
- Supports USB & Infra-Red Port
- Switching Voltage Regulator

- MMX Technology
- Supports Intel Pentium, AMD K5, K6 and Cyrix 6X86, 6X86L
- Supports SDRAM (DIMM Module)
- Supports Up To 512K Cache On Board
- Giga I/O Chip
- DMI Feature
- Supports USB & Infra-Red Port
- Switching Voltage Regulator

- MMX Technology
- Supports Intel Pentium, AMD K5, K6 and Cyrix 6X86, 6X86L
- Ultra DMA/33 IDE
- ACPI For PC '97
- Supports SDRAM (DIMM Module)
- Supports USB & Infra-Red Port
- Built-In 512k PB Cache
- Switching Voltage Regulator
- DMI Feature

- Jumperless CPU Voltage (Auto)
- CPU & System Fan Alarm
- CPU & System Overheat Alarm
- CPU Speed Auto Slow Down
- Auto Fan Off At Suspend State
- System Voltage Monitoring
- System Intrusion Detection
- Remote Ring On
- Extra Added Features
- Automatic Clock Shut-off of All Unused SDRAM & PCI Slots
- BIOS Frequency Selection Function
- "Spread Spectrum Capability" Reduces EMI By 25%



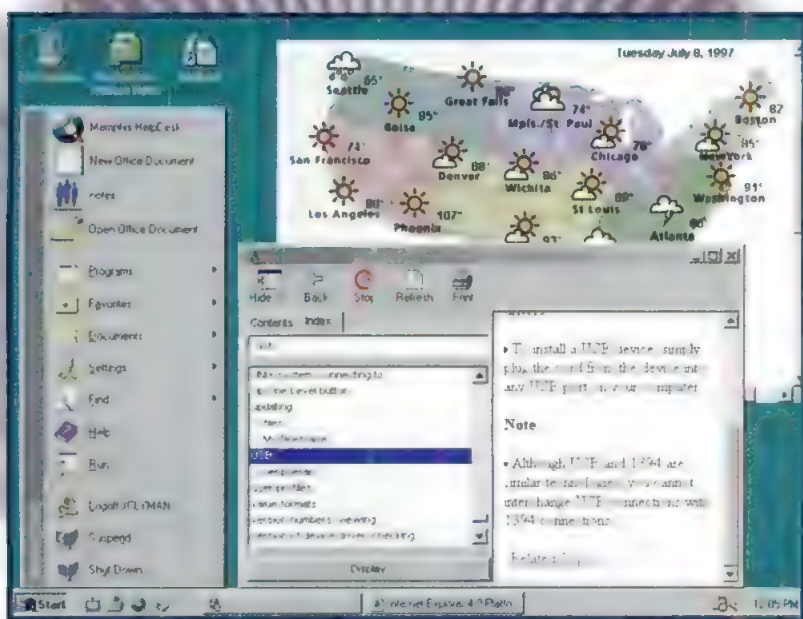
Shuttle
<http://www.spacewalker.com>

Shuttle is a registered trademark and Spacewalker is a trademark of Shuttle Computer Company. All other trademarks and registered trademarks are the property of their respective owners. Specifications are subject to change without notification. We are not responsible for errors of typography or photography

CIRCLE 178 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

Windows 98

Memphis & IE 4.0



Microsoft's new operating system looks a whole lot like its new browser. In this preview, we give you a sneak peek at both of them.

By Michael J. Miller

Now that most of us have gotten comfortable with running Windows 95 or its look-alike cousin, Windows NT Workstation 4.0, Microsoft is readying new versions of each that promise a dramatic change in the way we look at our operating systems.

Although Microsoft won't confirm that Windows 98 is the official name, the upgrade to Windows 95, code-named Memphis, is currently in beta test with tens of thousands of people. (When booted, it says *Memphis*, though almost everyone expects Windows 98 to be the formal name.) At the same time, Microsoft promises that Windows NT 5.0 will be only a few months behind and will share many of the same characteristics.

At PC Magazine Labs, we've tested the early versions of Memphis on dozens of machines. We've also been checking out Microsoft Internet Explorer 4.0 (available in beta as a standalone product), which provides the new user interface on

IN THIS REVIEW

Web Integration/Internet	Memphis Beta 1 Highlights	106
Explorer 4.0.....	IE 4.0: More than Memphis.....	112
Performance Enhancements.....	What to Expect from	
Manageability and Support.....	Memphis Beta 2.....	115
System Plumbing	Should You Upgrade to	
Networking Improvements.....	Memphis Now?	120

Memphis Beta 1 Highlights

New feature	Significance	Availability
ACPI	Supports OnNow, minimizing boot-up and shutdown time; the OS has more system management control.	Memphis only.
Active Desktop	Adds a push client to the desktop and the browser.	In IE 4; can be downloaded at www.microsoft.com/ie .
Cutting-edge hardware support	Built-in driver support for the latest hardware technologies, such as AGP, DVD, and FireWire.	Memphis only; vendors may add Windows 95 support.
Disk Defragmenter Optimization Wizard	Speeds the load time of favorite applications.	Memphis only.
FAT32	More efficient support for large hard disks.	In Windows 95 OSR 2; available through purchase of a new motherboard, hard disk, or CPU.
FAT32 conversion utility	Enables users to move from FAT to FAT32.	Memphis only; third-party tools such as Partition Magic are available for OSR 2.
HelpDesk	Connects the user to Microsoft's support center.	Memphis only.
Internet Explorer 4.0	Supports HTML 4; improved user interface.	Can be downloaded at www.microsoft.com/ie .
LDAP	Gives the mail client access to public directories.	In Outlook Express; can be downloaded as part of IE 4.
Multiple-display support	Supports multiple physical monitors on a continuous desktop; can run up to four monitors.	Memphis only.
PowerToys	Windows 95 extras incorporated into the new OS.	Can be downloaded now at www.microsoft.com/windows/software/powertoy.htm .
System Update	Makes sure your system has the latest drivers.	Memphis only.
USB	The Universal Serial Bus makes hardware installation a snap.	In OSR 2.1; available with purchase of a motherboard, hard disk, or CPU; parts of OSR 2 can be downloaded at www.microsoft.com/windows/pr/win95osr.htm .
Web integration	Gives your Windows desktop a browser-like feel.	In IE 4; can be downloaded at www.microsoft.com/ie .
Windows 95 bug fixes	Incorporates all of the Windows 95 updates and patches.	Can be downloaded now at www.microsoft.com/windows95/info/system-updates.htm .
Windows Scripting Host	Can automate any Windows functions; has language-independent architecture.	Memphis only.
Win32 Driver Model	Unifies Windows NT and Memphis driver models.	Memphis only.

top of the new operating systems; it could become your new UI for Windows 95 and NT 4.0 if you so choose.

It's too early for a final analysis, since neither Memphis nor IE 4.0 is as stable as you would like a final product to be, and each is missing some features. But we can tell you a lot about both what's in the products and what using them is like.

MOVING TO MEMPHIS

Memphis is an unusual upgrade from Windows 95. Although the basic architecture hasn't changed much from Windows 95, it has a number of new focuses, many of which are already available.

Internet integration is by far the most visible change in Memphis. In addition to a large number of enhancements to the Internet Explorer browser itself, the overriding innovation is the browser's integration into the Windows desktop. In

other words, Memphis can make your desktop, including your files and folders, look like Web pages, complete with HTML-based pages containing descriptions of just about everything.

While this takes some getting used to, the change isn't as jarring as it might seem, particularly for users who have spent a lot of time with browsers. But it does require some adjustments. What's also worth noting is that most of these features are optional, so you or an administrator can turn them on or off; the default setting for the

Web integration features is off.

If you choose this Web integration, you get a consistent browser-like view of everything from a local disk to a LAN drive to the Internet itself. The result is that Windows now looks more like part of the Internet, and vice versa.

This integration has big implications even when you're not looking at Internet pages. Because Internet Explorer is now effectively the user interface, everything works the way it does in a browser. You can get a toolbar with such things as back and forward buttons in almost every window. Files and folders are hyperlinked, and a single click will now open a file, instead of the double-click required in previous versions. More important, files and folders can now contain much more descriptive information, just as if your folder were a Web page. The taskbar and Start menu have been updated to integrate with the Internet better. You can access your e-mail or your Favorites menu much easier. Even your static Windows wallpaper can be replaced with an HTML-based Active Desktop. And HTML is also becoming the basis for the standard Windows help system.

Internet Explorer 4.0 has many compelling enhancements in addition to its desktop integration. Most notable is its ability to receive subscription-based—or push—content, and it offers improved mail and conferencing features as well. Microsoft has also made dramatic improvements in the underlying HTML support. Memphis includes a number of other fea-

tures for easier Internet use, including improvements to Dial-Up Networking. For example, it now supports the ability to aggregate multiple lines into one faster connection.

MORE THAN THE BROWSER

Although Internet integration is the most visible change, it's certainly not the only one. Several key enhancements enable Memphis to take advantage of modern

www.pcmag.com

Join us online for up-to-the-minute updates on the new OS, and bookmark **InternetUser** (www.internetuser.com) to keep track of the latest Internet Explorer developments.

Our Contributors: MICHAEL J. MILLER is the editor-in-chief of *PC Magazine*. FRANK J. DERFLER, JR., is the senior networking editor and JOHN CLYMAN is the senior online editor of *PC Magazine*. LARRY SELTZER is a technical director at PC Magazine Labs. STEVE RIGNEY is a contributing editor of *PC Magazine*. JAY MUNRO was the project leader, and DAVID LIDSKY was the associate editor in charge of this story.

hardware. This operating system now has built-in support for Universal Serial Bus (USB) and IEEE 1394 (FireWire) ports, DVD drives, and AGP graphics, all of which are in systems now or will be, beginning this fall and into 1998.

On the multimedia front, the DirectX 5.0 and Active Movie multimedia formats now support the MMX instruction set; and a new feature directly supports video and digital data from cable and satellite systems, although this broadcast support will not be implemented until the next beta. In addition, Memphis beta 1 lets you use up to four monitors at a time, and beta 2 will support up to eight (something the Macintosh has supported for years).

Finally, Microsoft has focused on improving manageability, both for corporate IT departments and end users. Perhaps the most significant of the features here is the ability to add new drivers and system updates automatically over the Internet. This works with a new system file checker for making sure the important Windows files are up to date. Other features include a new system troubleshooter and backup utilities.

NOT EARTHSHAKING

All of this sounds—and thus far, seems to be—quite nice but not earthshaking. Many of the key features are already available for trial and will continue to be available for downloading. This includes Microsoft Internet Explorer 4.0, with its desktop integration features, as well as most of the new hardware drivers.

Even the FAT32 file system debuted with OEM Service Release 2 of Windows 95 more than a year ago. So if you have a new computer, you may already have it.

Memphis, however, will be the first version that will upgrade your existing FAT-based hard disk to FAT32. This new file system lets you have more clusters of data on your hard disk, which means it can support larger hard disks. Just as important, it can save large amounts of disk space for small files that would consume only a small fraction of a cluster in the older FAT16 file system that DOS and Windows have used for years. A new feature analyzes your applications and stores program files contiguously and in the order they are likely to be loaded, thus making applications faster to load by minimizing time-consuming disk

seeks. This lets the data stream off the disk at the highest possible speed.

On the architectural side, the basic underlying 32-bit Windows architecture is unchanged. Thus, your existing Windows 95 applications should all run. Don't expect to see a whole new crop of software designed to work exclusively with Memphis.

One change is the introduction of a new method for writing device drivers that will be shared between Memphis and the upcoming upgrade to Windows NT. The Win32 Driver Model should make it easier for developers to create new devices that

support both operating systems.

According to Microsoft, Memphis could be on retail shelves and in computers for retail and direct sale by the end of this year—or, at the latest, early in 1998.

As a base for your current applications, what you're likely to be left with is a nice upgrade but one more akin to the change from Windows 3.0 to Windows 3.1, not from 3.1 to Windows 95. Yet despite that, the integration of the browser and the desktop and the changes to the browser portend significant changes for the way the OS works, and the way you interact with it.

Web Integration/Internet Explorer 4.0

Memphis brings a lot of features to the table, but one of its central themes is the seamless integration of the Internet into the operating environment. Thus Microsoft Internet Explorer 4.0

(IE 4.0) not only offers the sort of things you'd expect in a new Web browser—enhancements in HTML, usability improvements, support for push technology—but also features designed to help it blend right into the fabric of Windows itself. Although IE 4.0 and its accompanying components are far from complete, we had an opportunity to test a prerelease version with shell integration that was largely functional, if still a bit on the unstable side.

Microsoft expects to ship the standalone, free version of IE 4.0 for Windows 95 and Windows NT in late summer; later, of course, IE will become an integral part of Memphis itself.

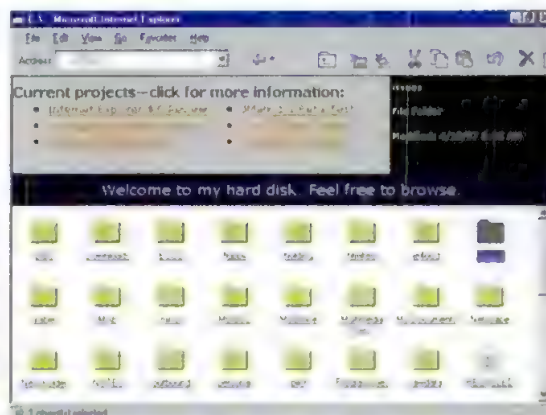
Still, the most intriguing aspects of the new IE 4.0 are those where it ties directly into the OS, in what Microsoft calls *Complete Web Integration* and the Active Desktop. IE 4.0 aims to be a sort of universal browser that can not only hop from Web site to Web site but also run complete applications and even surf folders on your hard disk or on a shared network drive, displaying the contents of those folders in HTML.

It's now possible—even easy—to add a "Web view" to any folder on a storage device; when you open that folder from IE, instead of seeing the usual tableau of

icons, you can get a far more user-friendly view that looks much like a Web page.

Two straightforward applications of the Web views are on software-installation disks—you won't need to search for the SETUP.EXE file when you can get a splashy screen that reads "click here to install"—and on network file-server volumes to make them easier to navigate.

Because the Web views can contain any HTML (as well as an area devoted to

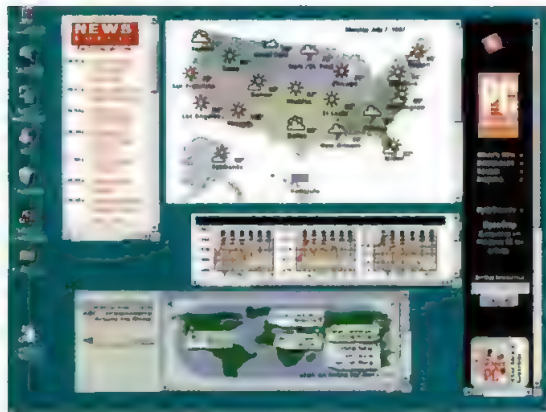


You can create Web views of your folders, filling them with useful navigational guides and instructions.

traditional file listings or icons), it's even possible to include Java applets that provide system information, e-mail links for reporting problems, dynamic HTML that provides mouse-over hints, and the like.

To create a Web view, you simply

choose **Customize This Folder** from the **View** menu, which starts a Wizard that opens Microsoft's FrontPad Web-page editor (available in beta 2 of IE 4.0) with a template you can modify. The process is straightforward, although we found that



Your Active Desktop can contain entire Web pages, Java applets, and ActiveX controls.

FrontPad's lack of support for many of IE 4.0's more sophisticated HTML extensions resulted in layouts that were far from WYSIWYG.

By default, Internet Explorer sets up a simple Web view for the Windows Control Panel, which does make its maze of icons a bit prettier. Although it actually adds little in terms of useful information or instructions, it gives you an idea of the possibilities. Ultimately, the current Windows Explorer and Internet Explorer should become one and the same, although in the beta we tested the integration of the two was not entirely complete.

SUBTLE MESHING OF OS

The meshing of the Internet and the operating system occurs in more subtle ways as well. The Start menu gains a new Favorites entry, so you can get to your favorite Web sites quickly. The Find command on the Start menu now has a People option that searches public LDAP (Lightweight Directory Access Protocol) directories such as Bigfoot (www.bigfoot.com), Four11 (www.four11.com), and WhoWhere? (www.whowhere.com). And in deference to Web tradition, shortcuts and icons on the desktop are underlined to look like hyperlinks and can be activated with a single (rather than double) click.

Shell integration is complemented by the Active Desktop, which essentially re-

places the static Windows background wallpaper with a fully customizable Web page. In fact, the Active Desktop is a full-screen HTML page that can contain other Web pages, dynamic HTML, Java components such as stock tickers, ActiveX controls, and more.

When combined with IE 4.0's subscription capabilities, the Active Desktop essentially lets you build your own push-content client, which combines data from whatever sources interest you. (Note that unlike Netscape Netcaster, however, IE 4.0 doesn't integrate support for a full-blown, independent push client such as Marimba's Castanet Tuner, which is particularly suited to incremental downloading of applications rather than just Web pages.) While we like the ideas behind the Active Desktop, we did find it to be one of the browser's touchiest capabilities—often prone to misbehavior in the beta we tested.

The Active Desktop can easily get hidden behind application windows while you're working, but a new button on the taskbar keeps it just a click away—a welcome change from needing to right-click on the taskbar and choose **Minimize All Windows**. In fact, this new button is only one of many that appear on the taskbar to offer quick access to Internet features such as the Outlook Express mail client.

Of course, not everyone will find the shell integration and Active Desktop features appealing, and you can enable or disable them selectively to suit your preferences. Microsoft says that Version 4.0 of the Internet Explorer Administration Kit will allow system administrators to choose which of the shell-integration features they want to enable on their users' systems in addition to specifying default favorites, mail and news servers, and security settings.

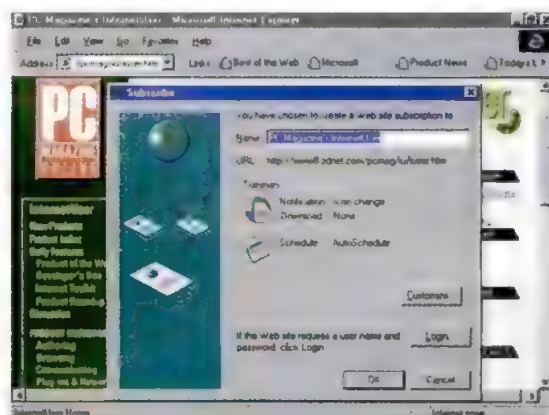
PREPARING FOR PUSH

The Active Desktop is one manifestation of IE 4.0's support for push technology,

which appears in a variety of guises. In its simplest form, you simply subscribe to pages or sites that interest you. Then IE 4.0 queries them periodically to see whether any content has changed. You can specify the browser's behavior when it discovers changes: It can simply alter the page's icon on your Favorites list to indicate new content, it can e-mail you a notification, or it can pull down new pages from the Web so you can read them off-line.

IE offers extensive options for customizing this off-line browsing capability, including the ability to specify how many levels deep into the site the browser should dig, what types of content should or should not be downloaded (for example, you can skip streaming media and Java applets), and when the updates should occur. At any time, you can switch to an off-line browsing mode with a simple menu option, and as soon as you try to follow a link that takes you to content not available locally, you'll be asked whether you wish to dial up and connect to the Internet.

You can apply subscriptions to any site, but IE 4.0's push capabilities begin to come into their own when Webmasters take specific efforts to enable them. By placing a CDF (Channel Definition Format) file on its server, a Web site can build



Subscribing to Web sites to enable off-line browsing and push takes place through this simple dialog box.

more traditional push "channels" that specify exactly what information should be delivered to subscribers and on what schedule. Users can place these channels on their Active Desktops by simply clicking a link to the CDF file.

Sites that want to go even further with

AWE 64

SOUNDS OF THE

Symphony



Experience an evening at the symphony with the new Sound Blaster® AWE64 Gold™ and hear every crisp sound with perfect audio fidelity. The Sound Blaster AWE64 Gold is simply the best sounding Sound Blaster ever. And it's designed specifically to upgrade your PC's multimedia audio system. Play back up to 64 simultaneous voices, producing a richer, fuller sound than

previously thought possible. With 20-bit digital output, audio quality is uncompromised. And of course, compatibility is assured because it's a genuine Sound Blaster. To listen to and learn more about the Sound Blaster AWE64 Gold contact us at:

www.SoundBlaster.com/sound/AWE64Gold.

CREATIVE
WWW.SOUNDBLASTER.COM

1. Maestro Tapping Baton.
2. Piano Keys Dancing.
3. Entrance Of An Oboe.
4. Crashing Cymbals.
5. Violin Vibrato.
6. "Bravo, Bravo!"
7. Deep, Rhythmic Grooves Of a Cello.
8. Clarinet Scaling Octaves.
9. Audience Shuffling In.
10. Appreciative Applause.
11. Chord Progressions On Grand Piano.
12. Soft Strokes Of Harp Strings.
13. Chiming Triangle.
14. "Shhhhhhhhh..."
15. A Cymbal Brushing Lightly.
16. Cascading Clarinet.
17. Flute Solo.
18. Crescendo.
19. Playful Flirtation Of A Piccolo.
20. Boom Of A Tuba.
21. Pager Beeping.
22. Loud Clapping.
23. Low Tones Of A Stand-Up Bass.
24. Violin And Viola En Duet.
25. Piano Sonata.
26. Wailing Saxophone.
27. Smooth Slide Of A Trombone.
28. Exclamation Of A Trumpet.
29. Rolling Thunder Of A Timpani.
30. Arpeggio On The Violin.
31. The Reed Section.
32. Pages Of Sheet Music Turning.
33. Piano Playing Minuet In G.
34. Drum Keeping Tempo.
35. Violin Staccato.
36. Tambourine Jingle.
37. Clicking Castanets.
38. Relentless Beating Of Drums.
39. Regal Sound Of A French Horn.
40. Snare Drum Rattling.
41. Xylophone Resonating.
42. The Low Pitch Of A Bassoon.
43. Cello Staccato.
44. Pulsating Viola.
45. Viol D'Orchestre.
46. Flute Ensemble.
47. Fluttering Of A Flute.
48. Regimental Sound Of A Bugle.
49. Plucking Of A Violin.
50. "Encore! Encore!"
51. Orchestra Tuning Up.
52. Silence Between Passages.
53. Harmonic Wind From A Flute.
54. Oboe Solo.
55. Soft Snoring.
56. Decrescendo.
57. Beethoven's 5th.
58. Throats Clearing.
59. Chopsticks.
60. Sounds Of Intermission.
61. Brass Solo.
62. Rattling Of Maracas.
63. "Wake Up, Honey, It's Over."
64. The Final Movement.

push technology can multicast video to Internet Explorer NetShow clients. (Unlike many streaming-video solutions, which deliver one set of data for each active user, multicasting routes the same information to multiple users at the same time.)

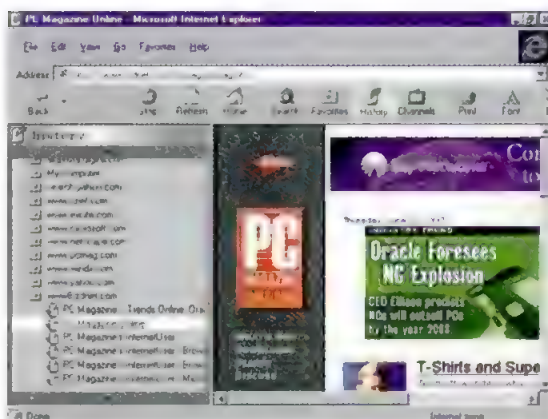
As with Netscape Netcaster, you can access IE 4.0 push channels through a *channel guide* that sits on your desktop. In the preview version of IE 4.0 we tested, the channel guide was an optional (and very rough) component that had to be installed separately, but Microsoft says it will be an integral part of the browser in the final version. (For more on Microsoft's and Netscape's push offerings, see "The Browser Push Is On," later in this issue.)

AND A PRETTY FACE, TOO

IE 4.0 also includes a variety of interface improvements—some substantial, and some subtle but nevertheless valuable. Among the changes we found most appealing were *browser bars*, panels that pop into the left third or so of the browser window to provide context for operations such as searching the Web, working with your Favorites, and browsing your history list. The page you're currently visiting occupies the remaining right-hand pane.

The effect is somewhat reminiscent of mail programs that show your folders list in one pane while showing your message contents in another. When you're searching, for instance, your results list persists in the search panel as you look at each page to the right, so you can examine multiple pages rapidly without resorting to the Back button. Even more impressive is the History panel, which organizes the places you've been both by site and by date, making it far easier to find a page you visited in the past than the simple linear structures of earlier history lists.

We also liked the ability to organize Favorites by dragging and dropping them within the menu, a capability that Netscape pioneered. (This feature had some bugs in the preview we tested, though.) The drag-and-drop capability also ex-



Surfing through your cache is easier with the History browser bar, which can organize your cache by site.

tends to the Windows Start menu.

Numerous minor user-interface improvements grace the product as well. *Security zones* let you set different default security policies (indicating what's safe to download, what's safe to execute, and so forth) for different classes of sites—intranet, trusted, restricted, and the Internet in general. (See "Protection at the Desktop," later in this issue, for more information on personal security.)

Other small but significant enhancements: The progress indicator in the status bar now shows the total portion of the page loaded, rather than indicating the download progress for every individual graphic on the page. Also notable is the addition of AutoComplete, a feature users of Microsoft Office 95 and 97 will find familiar. As you type a URL into the browser's address bar or a filename into a directory folder address window, IE 4.0 compares it with previously visited sites and attempts to finish the address for you.

Underneath the covers, Microsoft also says that IE 4.0 now supports a variety of new standards, including HTTP 1.1, the Java 1.1 API, and Authenticode 2.0, though we did not specifically test these claims.

OUTLOOK EXPRESS

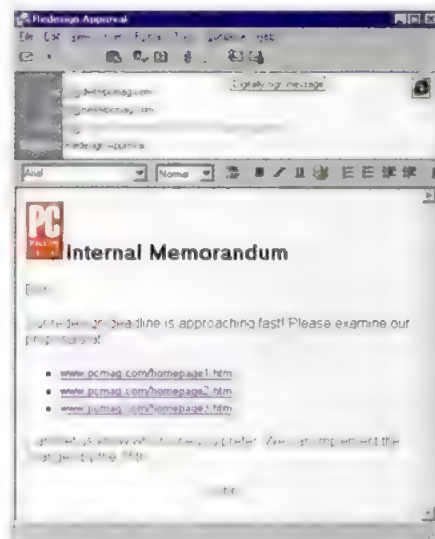
Part of the IE 4.0 package is Outlook Express, a fairly capable e-mail client and news reader that replaces the unremarkable Internet News and Mail package bundled with earlier versions of Internet Explorer. Like its counterpart from Netscape, Outlook Express supports both SMTP/POP3 (Simple Mail Transfer

Protocol/Post Office Protocol 3) and the more powerful IMAP4 (Internet Mail Access Protocol 4) e-mail standards; when this is used in conjunction with an IMAP4 server, you can choose to keep replicas of messages on multiple machines and download only message headers when you're connected from the road, for example.

Outlook Express also supports LDAP (Lightweight Directory Access Protocol), which lets it search public or private address directories. If you're addressing a message and don't have someone's address handy, with a click you can search these public address books for the information you need. When you reply to a message from someone, Outlook Express automatically adds that person's name to your address book.

Outlook Express supports HTML-formatted mail and includes "stationery" that you can use to set a standard default appearance for your documents. The package also lets you filter inbound mail based on a wide variety of options, though you can't set up Boolean (AND/OR) filters.

Outlook Express also serves as a read-



Outlook Express lets you create rich HTML stationery for your e-mail.

er for Internet newsgroups, and it offers the same kind of filtering capabilities that are available for mail. The software lets you set up multiple user profiles so that you can support two or more different users (or two or more ISPs) with the same package.—John Clyman

AWE 64 SOUNDS OF INVASION



Sound Blaster® AWE64 Value

The latest Sound Blaster technology is ready to invade your multimedia PC. At an out of this world price, **\$99.99** (estimated street price), Sound Blaster AWE64 Value is your logical upgrade to high-fidelity audio. Hear every eerie sound with frightening clarity with up to 64 simultaneous voices of Advanced WaveEffects™ & WaveGuide Synthesis. 512K onboard RAM for SoundFont® samples and high performance, lets you add your own alien sounds. Also

included, the hottest Internet software. To learn more about the Sound Blaster AWE64 Value, contact us at:

www.soundblaster.com/sound/AWE.

CREATIVE
WWW.SOUNDBLASTER.COM

1. "We Come In Peace."
2. Blasting Ray Guns.
3. People Screaming.
4. "You Must Believe Me!"
5. Exploding Buildings.
6. Whirring Space Ships.
7. Brains Being Sucked.
8. Bones Crunching.
9. Aliens Phoning Home.
10. Metallic Scraping.
11. Cars Crashing.
12. Kidneys Bursting.
13. Insertion of Probes.
14. Heads Exploding.
15. "Run for Cover!"
16. "Warning."
17. Aliens Melting.
18. Pods Hatching.
19. Destroying the Monster.
20. Buildings Imploding.
21. Spaceships Docking.
22. Boiling Flesh.
23. "Mayday, Mayday!"
24. Exploding Spaceship.
25. People Running.
26. "I saw a UFO!"
27. Planes Taking Off.
28. "We're at DelCon 1."
29. Aliens Communicating.
30. Children Crying.
31. Slurp.
32. Clink of Autopsy Instruments.
33. Laser Swords Crashing.
34. "Hyperspace!"
35. Flesh Being Torn Off Bones.
36. "They're Coming."
37. Wailing Sirens.
38. "You Must Die."
39. "Beam Me Up."
40. Zap!!!
41. Air Locks Closing.
42. "Oh, My God!"
43. Lasers Charging Up.
44. "We Need More Power!"
45. Ray Guns Blasting.
46. Calling the Mothership.
47. Horns Blaring.
48. "We Won!"
49. "Lock on Target!"
50. Crystals Charging.
51. Area 51 Guard: "No Admittance."
52. Zap Zap!
53. Warning Alarms.
54. Air Locks Opening.
55. "Set to Stun!"
56. "Red Alert!"
57. Shields Up.
58. Warp Speed.
59. "Blast 'em!"
60. Eyeballs Squishing.
61. Spaceships Cloaking.
62. Radar Ping.
63. "Fire at Will!"
64. "Take Me to Your Leader"

IE 4.0: More than Memphis

Although Internet Explorer 4.0 is a central component of the Memphis OS, it will also appear as a standalone product—or more precisely, a suite of products that includes Outlook Express, for managing Internet mail and Usenet newsgroups; FrontPad, a stripped-down version of Microsoft's Web-page-authoring tool FrontPage; and NetMeeting software, which enables live collaboration with other users. In our testing of a prerelease version of IE 4.0, we found it to be generally impressive even in the absence of the optional shell integration features.

DYNAMIC HTML TAKES THE STAGE

With the advent of another generation of browsers, it's inevitable that support for HTML—the HyperText Markup Language that actually defines the appearance of Web pages—will evolve as well. In many regards, IE 4.0 advances support for HTML more than any earlier release, particularly with its rich support for dynamic HTML (dHTML).

In this area, IE 4.0 has a clear edge over Netscape Navigator 4.0, although this technical superiority doesn't necessarily make life easy for site developers. The two browsers' HTML extensions are largely incompatible, and neither implements the draft HTML 4.0 specification recently agreed on by the World Wide Web Consortium (W3C).

In IE 3.0, Microsoft introduced support for CSS (Cascading Style Sheets) level 1, which gave Web authors enhanced control over the layout and typography of their Web pages. IE 4.0 adds support for absolute positioning and layering, which means that objects can be anchored to specific horizontal and vertical coordinates within the browser's *canvas*, or display area. Furthermore, objects can overlap other objects, can be made visible or

invisible, and can be moved around to create effects such as titles or images that slide onto a page from the side.

All of these capabilities are supported by Navigator 4.0 as well, although the specific HTML syntax differs. Where IE 4.0 really ups the ante is with its support for dynamic HTML and its HTML object model. IE 4.0 makes every character on a page, and every HTML tag, directly accessible to scripting languages such as JavaScript.

Webmasters can thus change text on a page dynamically in response to

tents of a database—a boon especially for intranet applications such as phone listings.

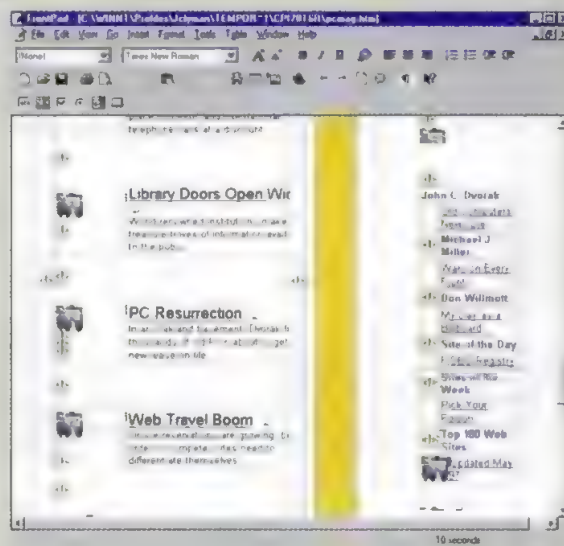
BEYOND BROWSING

Like Netscape Communicator, the Internet Explorer Suite includes a tool for editing Web pages: FrontPad, a downsized version of Microsoft's popular FrontPage editor, an Editors' Choice in our March 4, 1997, roundup. The FrontPage elements left out of FrontPad were primarily the multipage-site-management and server-side capabilities, but you do get Personal Web Server.

FrontPad uses a word processing metaphor for composing HTML pages: You type in your text and format it in a more-or-less WYSIWYG fashion. Like its big brother, FrontPad supports tables and forms, though not frames. Unfortunately, FrontPad doesn't support many of the newer HTML extensions that make the IE 4.0 browser so appealing, including CSS and dHTML. You can add newer tags manually, using FrontPad's color-coding HTML text editor, but the results often garble the editor's attempt to producing a WYSIWYG rendition of the pages.

IE 4.0 also comes with the NetMeeting client, which lets you engage in live chats with other users, scribble on an electronic whiteboard, and even share applications with other users. And it includes NetShow as well, allowing it to receive multicast video streams.

Although we would be premature to compare the unfinished IE 4.0 Suite directly with Netscape's Communicator suite, the balance of capabilities looks fairly even, with Netscape enjoying the edge of timeliness and Microsoft claiming technical superiority for its implementation of dynamic HTML. —JC



FrontPad, the HTML editor in the IE 4.0 Suite, starts to lose its WYSIWYG feel when you are creating complex pages.

user events such as clicking the mouse or dragging and dropping. Simple applications include hierarchical tables of contents, pop-up tool tips, pull-down menus, even text that "knows" the size of the browser window and changes its contents accordingly. The big advantage of dHTML is that you can execute all these features on the client side, without any communication with the server.

As the page's contents change, text is automatically flowed around objects. IE 4.0 also supports a *data-binding capability* that lets it build pages dynamically based on the con-

AWE64

SOUNDS OF

A Traffic Jam

Beat the Rush!



Sound Blaster® AWE64 Gold
\$199.99

Estimated Street Price



Sound Blaster AWE64 Value
\$99.99

Estimated Street Price

Upgrade to the hottest sound cards that will drive your PC audio into a new realm! Introducing the best sounding Sound Blasters ever, bringing high-fidelity to your multimedia PC at an incredible value. To learn more about the Sound Blaster AWE64's, contact us: www.soundblaster.com/sound/AWE.

CREATIVE
 WWW.SOUNDBLASTER.COM

CIRCLE 095 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

© Copyright 1997 Creative Technology Ltd. Sound Blaster and the Creative logo are registered trademarks of Creative Technology Ltd. in the United States and/or other countries. All other names are property of their respective owners. All specifications are subject to change without prior notice. All rights reserved.

1. Engines Pinging.
2. Horns Honking.
3. "Are We There Yet?"
4. "Where'd You Get Your License?!"
5. "I Need to Get to the Store Before They're Out of Sound Blaster AWE64's!"
6. Bumpers Crunching.
7. Sirens Wailing.
8. "Get Out of My Way!"
9. Cop: "License Please."
10. Muffler Dragging Behind Car.
11. Cars Crashing.
12. Engines Overheating.
13. Sunroof Opening.
14. Gasket Blowing.
15. Car Burning at Side of Road.
16. Tire Hissing.
17. Vroom Vroom.
18. Horn of a Semi Truck.
19. Car Phone Ringing.
20. "It's Your Fault!"
21. Brakes Screeching.
22. "What Do You Mean You Don't Have Insurance?!"
23. Music Blasting.
24. Horns Blaring.
25. Kids Screaming in Their Car Seats.
26. Engines Revving.
27. Traffic Helicopter Overhead.
28. Tire Iron Hitting Pavement.
29. Clunk of Transmission.
30. Blaring Radios.
31. Turn Signals Blinking.
32. Car Stalling.
33. Slurping Soda.
34. Changing Radio Stations.
35. Car Doors Opening.
36. Rolling Down Windows.
37. Shifting Gears.
38. Drumming on Steering Wheel.
39. Munching Potato Chips.
40. "I Wish I Had Some Coffee."
41. "Not AGAIN!"
42. Air Bags Popping.
43. Backfire.
44. "Why Didn't I Work at Home Today?"
45. Singing With the Radio.
46. @#\$(!)%&#!
47. Changing CDs.
48. "Hi Honey, I'm Going to Be Late."
49. Ambulance Siren.
50. Car Running Out of Gas.
51. Engine Choking.
52. People Arguing.
53. Glove Box Slamming Shut.
54. Door Locking & Unlocking.
55. Seats Moving.
56. "Are We There Yet?"
57. Cars Speeding By in Other Direction.
58. Rustling of Newspaper.
59. "I Told You We Should Have Taken the Other Freeway!"
60. Air Conditioner Blowing.
61. Pages Beeping.
62. "There's a Seven Car Pile Up..."
63. "Are We There Yet?"
64. "It's Finally Moving!"

6 ppm

True 600 dpi

Laser Printing

Print like
the Fortune 500®
for under \$300.



Why choose between advanced technology and affordability? Not just "laser quality," the new Mita DP-560 offers true 600 DPI B/W laser printing. It prints from any Windows® 3.1 or Windows® 95 application at up to 6 PPM and has a full 1 MB of memory. Best of all, the compact DP-560 is priced below \$300,* so now even the smallest of small businesses can afford to look like the big guys.

mita
can help
www.mita.com

* Expected selling price. ©1997 Mita Copystar America, Inc. Windows® is a registered trademark of Microsoft Corporation. As an ENERGY STAR® Partner, Mita Copystar America, Inc. has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

6 ppm

True 600 dpi

Laser Printing

CIRCLE 221 ON READER SERVICE CARD

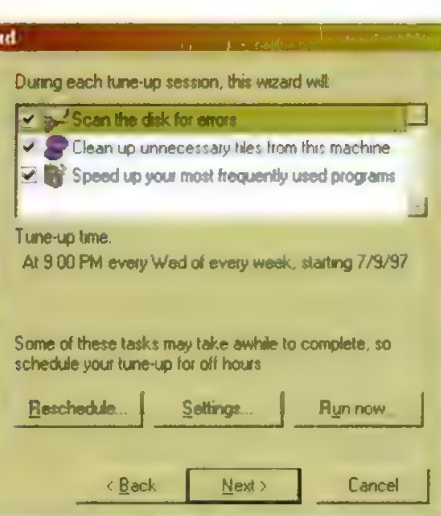
Performance Enhancements

Microsoft claims that Memphis is a faster Windows, and in some ways we've found this is true. It's too early to conduct real system performance tests with tools such as our Winstone benchmark program, but we were able to look at Memphis's most important performance enhancement feature: the Disk Defragmenter Optimization Wizard. Early performance testing indicated that load times for applications did decrease using the Wizard, most dramatically if you have converted your hard disk to FAT32.

Several companies, including Acceleration Software and Quarterdeck, sell utilities that they claim will accelerate application loads, but the results on our tests have

been lukewarm. The third-party utilities monitor the application load, track the pattern of clusters loaded from disk, and then prefetch those clusters in future loads. In other words, they don't eliminate random access from the load process, they just attempt to mitigate the problem by overlaying the processing and file load parts of app loading in a more effective way.

Memphis can better any third-party tool in app-loading acceleration because of its approach. It does the same monitoring process, then rewrites (or at least attempts to rewrite) the file on-disk in a contiguous



The Tune Up Wizard, like System Agents from Microsoft Plus!, schedules recurring disk maintenance tasks such as defragmenting.

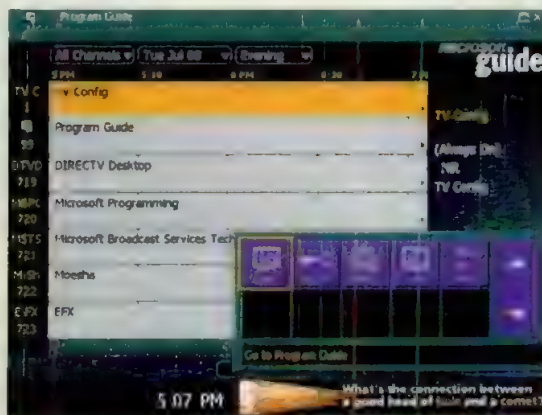
stretch. This eliminates random access to the extent that Memphis is able to find a large enough contiguous block for the files. This method should yield a relatively great advantage on disks with

What to Expect from Memphis Beta 2

According to Microsoft, beta 1 of Memphis is nearly feature-complete. The three components that didn't make it into beta 1 are expected in beta 2: all of the Broadcast Services and elements of the Internet Explorer Suite, the FrontPad page editor, and the NetShow streaming multimedia player. The multiple-monitor feature will also support up to eight monitors in beta 2.

Microsoft is looking to turn your PC into a TV with its array of support for broadcast services. The Broadcast Services include two components: the TV Viewer and TV Tuner. While the TV Viewer is included in this beta, it is missing some of its planned functionality. The current version lets you only connect to a Web site, enter your ZIP code, and, if your cable company participates, view a listing of the shows playing on TV. The shipping version of the TV Viewer will let you watch videos in a win-

dow on your desktop. An enhanced TV utility will also enable you to view additional information about the video and even interact with the programming.



Memphis's future includes turning your PC into a TV. This program guide will include a TV window in the next version.

The TV Tuner utility will let you install an analog, cable TV, or satellite card in your PC to accept multicast information from a provider. This push technology will let you

view sports scores and other information over the same medium that you use to watch TV. Note that this feature requires a special tuner adapter in your PC, and your local cable operator, satellite service, or TV station must offer multicast IP services.

FrontPad and NetShow are elements of the Internet Explorer Suite. Although the IE 4.0 browser in Memphis beta 1 is the same as the one in beta 2 of the IE 4.0 Suite, not all the additional utilities bundled in the IE 4.0 Suite made it into the beta 1 build of Memphis. Both FrontPad and NetShow will be included in the shipping version of IE 4.0 and will be integrated into beta 2 of Memphis. If you are run-

ning beta 1 of Memphis and you want FrontPad and NetShow, you can install beta 2 of IE 4.0 on top of Memphis to get these additional utilities.—Steve Rigney

faster data-transfer rates and less on disks with fast seek times.

We also found some other isolated improvements in system performance. For example, System Shutdown has been accelerated. Memphis does not attempt to shut down all the devices and network connections formally, as Windows 95 did. While a formal shutdown may seem to be good practice, it's not really necessary in the real world. By simply disconnecting from the resources, devices recover in time for future reconnection. Eliminating these parts of the shutdown process also eliminates some opportunities for the system to lock up during shutdown.

Lastly, Microsoft has added improved MMX support in the bundled DirectX 5.0. This means that DirectX applications running the emulation libraries on MMX processors will be considerably faster than those running on non-MMX processors. If you have an MMX system without a very good 3-D accelerator, you will notice a greater performance improvement than if you already have great 3-D acceleration.—Larry Seltzer

Manageability And Support

As if to acknowledge that some challenge is attached to keeping an OS humming, Microsoft designers have built some noteworthy tools into this version.

For starters, Memphis includes a help desk utility that walks users through many common problems. An Internet update utility automatically finds and installs the latest drivers and patches you need. And Microsoft moves forward with its Zero Administration for Windows (ZAW) initiative, which is intended to help its customers control management costs for Windows desktops by building administrative capabilities directly into its client and server OSs. Memphis is slated to integrate the client-side technology, called the Zero Administration Kit (ZAK).

The help desk utility fronts three different sources of information: Local



Memphis adds a help desk utility, giving you local help, Web-based updates, and e-mail technical support.

Help, Technical Support, and Web Resources. Local Help dispenses assistance on common user questions about Windows, such as how to change a font or install a printer, and includes some new troubleshooting wizards.

Web Resources scans your hard disk to see all your installed drivers and software. Then, using ActiveX controls, it connects to a Microsoft Web page to look for updated versions of programs. You then select the new drivers you want to install; more important, you can uninstall a driver that is causing problems.

The Tech Support portion is designed specifically for beta testers. When Memphis encounters an error, such as a General Protection Fault, it invokes the familiar Dr. Watson utility. Dr. Watson gathers data about the cause of the error, which the help desk sends as an e-mail to Memphis developers.

ZAW! ZAK!

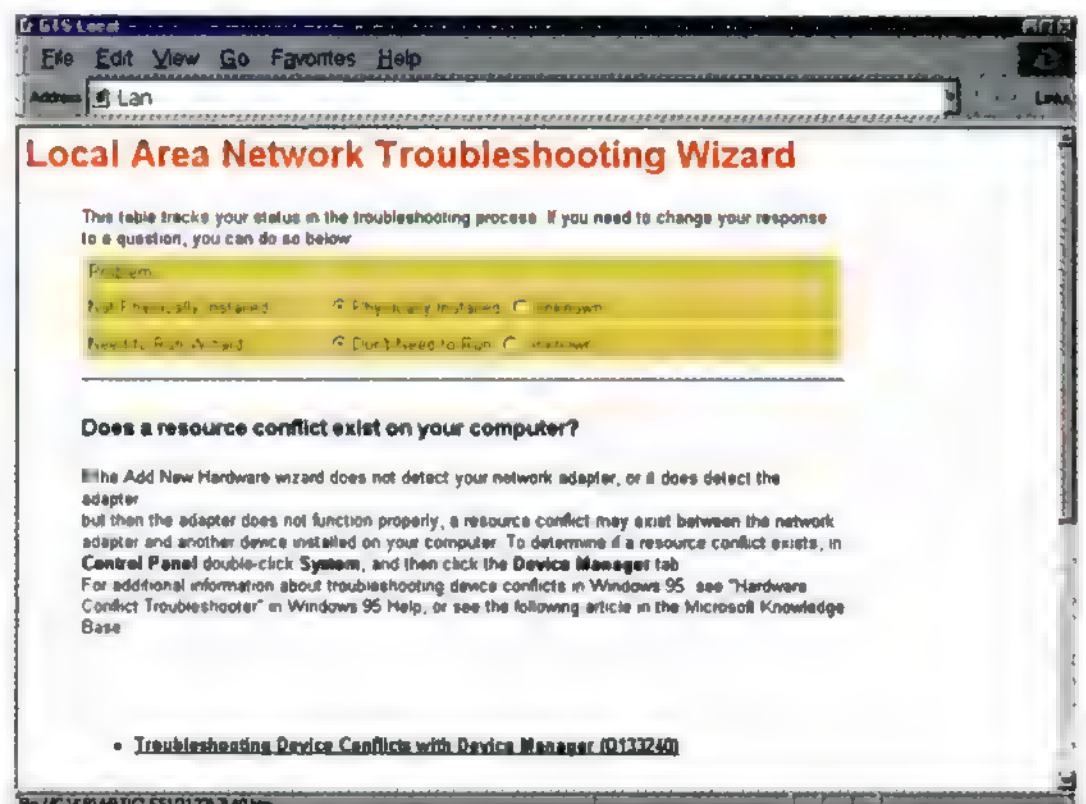
ZAW includes a centralized server application (which runs on Windows NT) that will help network managers manage and support their client PCs. The ZAW utilities are teamed with a

scripting utility, a troubleshooting application, and a system checker. The ZAK component is also an optional package for Windows NT and will soon be available for Windows 95.

ZAK, in its simplest form, is a set of examples that show you how to configure user profiles and system policies in Memphis to manage what your users do. You can perform tasks

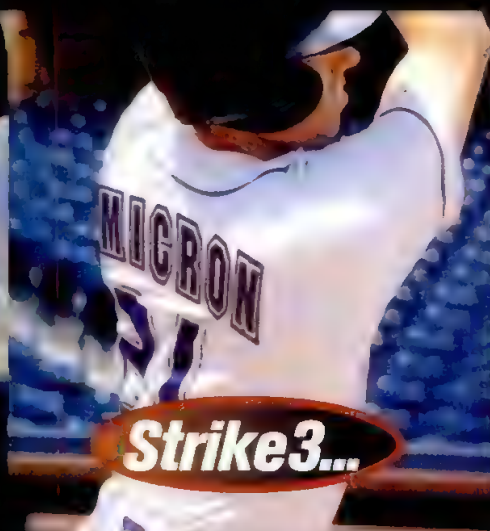
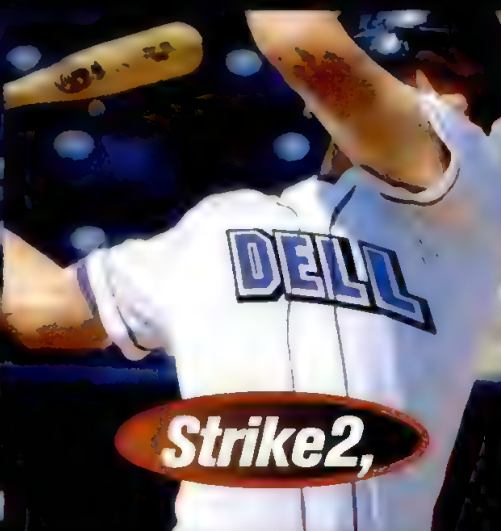
such as restricting users to a single application or denying them access to one of their local drives. This helps prevent them from installing unwanted software on the network or a company PC. Although Windows 95 had the policies and profiles to do this, the documentation on how to use them was inadequate. Microsoft hasn't said, though, whether ZAK will stay in Memphis or become an optional product.

The system troubleshooter is a great tool for administrators but a dangerous one for users who don't know what they're doing. The troubleshooter lets you edit configuration files easily, including .INI, AUTOEXEC.BAT, and CONFIG.SYS, to determine whether a



The help desk utility includes a troubleshooting wizard, which will step you through solving common problems.

HEY, GATEWAY, DELL & MICRON...



...THERE'S A NEW TEAM IN TOWN

HERE COMES THE PITCH...

It's a whole new ball game in personal computers today, as Unicent Technologies steps up to the plate with a dazzling new line of computers, boasting power, technology and user-friendliness.

Backed by seven years of making and servicing computers for homes, schools and businesses, Unicent's new line-up is loaded - Pentium II technology, leading-edge peripherals, sophisticated support and competitive prices. And if all that sounds as impressive as the other guys, you've got the right idea!

Plus, we bring a special way of doing business to every product we sell to make your relationship with your Unicent computer the most satisfying it can be - right out of the box.



- It is easy to set up, easy to understand, easy to use.
- It brings you the latest technology and league-leading components for its class.
- It is designed to protect your investment by allowing you to easily change and upgrade your computer as you grow with it.
- It gives you one of the best guarantees available. You will find your Unicent computer so well-crafted that you should never need service. But if you do, you can count on us 24 hours a day, every day of the year, to be there with the technical support you need.

We pledge this to you, not only because we believe that trust and partnership are simply good business, but also because it's the way we ourselves would like to be treated.

On the next three pages, you'll see how we've loaded the bases. Now, it's your turn at the plate.



LEAGUE-LEADING SYSTEMS



UNICENT AVANTA

\$2999

*As Low as \$104/mo.

- Intel® 266MHz Pentium II Processor w/312KB Cache
- 64MB SDRAM [up to 384MB On-Board]
- Tool-Free Tower or Desktop Case
- Ultra DMA/33 IDE controller
- 6.5GB Ultra ATA IDE Hard Drive <10ms
- 17" Flat Screen NT Monitor
- Matrox Millennium II 8MB WRAM Video
- 24x Toshiba EIDE C-D-ROM
- 3.5" Floppy Drive
- Ensoniq™ PCI Wavetable Sound Card
- 2 USB Ports, Amplified Speakers
- 33.6Kbps US Robotics Voice/Fax Modem Speaker Phone [FREE upgrade to X2™ 56K]
- Microsoft® IntelliMouse®
- 104-key Win'95 Enhanced Keyboard
- MS Windows '95 CD
- MS Office '97 CD, Internet start-up kit
- 5-Year Parts, 1 Year On-Site Warranty

AVANTA 233XLP\$2879



266XLP

- **Designed with Intel's 440LX Chipset** - Creating the ultimate performance for the latest power hungry applications. This new chipset provides support for ECC RAM, AGP [accelerated graphics board], OnNow, SDRAM, and Ultra DMA/33 Hard Drive protocol, giving users the latest technology available.



- **Featuring Matrox Millennium II** - The next revolution in graphics technology is here today. Matrox has once again redefined graphics technology with the Millennium II's new MGA-2164W processor. This sixth generation of the MGA chip is a completely new design of the industry standard 64-bit graphics processor and is complemented by a fast 250MHz RAM DAC and powerful dual-ported WRAM memory. The new Matrox Millennium II offers superior graphics performance for the professional user, delivering optimum acceleration in ultra high resolutions such as 1920 x 1200.

**SEARCHING FOR A
GRAND SLAM SYSTEM?
INTRODUCING: THE
TOP OF OUR LINEUP.**



Toshiba DVD-ROM-The next multimedia revolution is at Unicent with the Toshiba DVD-ROM and MPEG-2 hardware compression board for**\$449** [installed]



US Robotics Bigpicture™ Video Kit-A high quality color camera with built-in microphone for true videophone capability. Video Capture card pulls images from home movies or VCR.

Full-Featured 33.6Kbps voice/video faxmodem upgradable to X2™ technology. Features an extensive selection of videophone, VideoFun and online communications software**\$399** [installed]

Unicent Technologies would like to offer sincere gratitude to the players and staff of the Akron Aeros Baseball organization.

UNICENT AVANTA

The Quickest, Most Advanced Operation Available.



AVANTA 266XLS

\$3699 *As Low as \$128/mo.

- Intel® Pentium III 266MHz processor
- 64MB SDRAM, Intel® 440LX Chipset
- 512KB Pipelined Burst Cache, Flash BIOS
- Tool-Free Tower or Desktop Case
- Adapter Ultra Wide SCSI controller
- 4 3GB Ultra Wide SCSI Hard Drive 7200RPM
- 15x Toshiba EIDE CD-ROM • 3.5" FDD
- Matrox Millennium II 8MB VRAM Video
- Ensoniq™ PCI Wavetable Sound Card
- 33.6Kbps US Robotics Voice/Fax Modem Speaker Phone [FREE upgrade to X2™ 56k]
- 2 USB, Amplified Speakers
- Microsoft® IntelliMouse®
- 104-key Win'95 Enhanced Keyboard
- MS Windows NT 4.0 Workstation
- MS Office '97 CD, Internet start-up kit
- 5 Year Parts 1 Year On-Site Warranty
- 17" Flat Screen 28 NI Monitor

AVANTA 233XLS \$3579

AVANTA 266XLA

\$2399 *As Low as \$83/mo.

- Intel® Pentium III 266MHz processor
- 32MB SDRAM, Intel® 440LX Chipset
- 512KB Pipelined Burst Cache, Flash BIOS
- Tool-Free Tower or Desktop Case
- Enhanced IDE controller
- 4 3GB Ultra ATA IDE Hard Drive <10ms
- 24x Toshiba EIDE CD-ROM • 3.5" FDD
- Matrox Mystique 220 4MB SGRAM Video
- Ensoniq™ PCI Wavetable Sound Card
- 33.6Kbps US Robotics Voice/Fax Modem Speaker Phone [FREE upgrade to X2™ 56k]
- 2 USB, Amplified Speakers
- Microsoft® IntelliMouse®
- 104-key Win'95 Enhanced Keyboard
- MS Windows '95 CD
- MS Office '97 CD, Internet start-up kit
- 5 Year Parts 1 Year On-Site Warranty
- 15" Flat Screen 28 NI Monitor

AVANTA 233XLA \$2279

UNICENT TITANA

Optimum Power, Speed and Superb Manipulation



TITANA G-233XS

\$2599 *As Low as \$80/mo.

- Intel® Pentium III 233MHz processor w/MMX™
- 64MB SDRAM, Intel® 430TX Chipset
- 512KB Pipelined Burst Cache, Flash BIOS
- Tool-Free Tower or Desktop Case
- Ultra DMA/33 IDE controller
- 6 5GB Ultra ATA IDE Hard Drive <10ms
- 24x Toshiba EIDE CD-ROM • 3.5" FDD
- Matrox Millennium II 8MB VRAM Video
- Ensoniq™ PCI Wavetable Sound Card
- 33.6Kbps US Robotics Voice/Fax Modem Speaker Phone [FREE upgrade to X2™ 56k]
- 2 USB, Amplified Speakers
- Microsoft® IntelliMouse®
- 104-key Win'95 Enhanced Keyboard
- MS Windows '95 CD
- MS Office '97 CD, Internet start-up kit
- 5 Year Parts 1 Year On-Site Warranty
- 17" Flat Screen NI Monitor

TITANA G-200XS \$2499

TITANA G-166XS \$2399

TITANA G-166XL

\$1699 *As Low as \$59/mo.

- Intel® Pentium III 166MHz processor w/MMX™
- 32MB SDRAM, Intel® 430TX Chipset
- 512KB Pipelined Burst Cache, Flash BIOS
- Tool-Free Tower or Desktop Case
- Ultra DMA/33 IDE controller
- 3 2GB Ultra ATA IDE Hard Drive <10ms
- 24x Toshiba EIDE CD-ROM • 3.5" FDD
- Matrox Mystique 220 4MB SGRAM Video
- Ensoniq™ PCI Wavetable Sound Card
- 33.6Kbps US Robotics Voice/Fax Modem Speaker Phone [FREE upgrade to X2™ 56k]
- 2 USB, Amplified Speakers
- Microsoft® IntelliMouse®
- 104-key Win'95 Enhanced Keyboard
- MS Windows '95 CD
- MS Office '97 CD, Internet start-up kit
- 5 Year Parts 1 Year On-Site Warranty
- 15" Flat Screen NI Monitor

TITANA G-233XL \$1899

TITANA G-200XL \$1799

UNICENT TITANA

Exceptional Value for Small Offices and Homes



TITANA 200VL

\$1549 *As Low as \$54/mo.

- Intel® Pentium III 200MHz processor
- 32MB EDO RAM, Intel® 430TX Chipset
- 512KB Pipelined Burst Cache, Flash BIOS
- Tool-Free Tower or Desktop Case
- Ultra DMA/33 IDE controller
- 2 1GB EIDE IDE Hard Drive
- 24x Toshiba EIDE CD-ROM • 3.5" FDD
- Matrox Mystique 220 4MB SGRAM Video
- Ensoniq™ PCI Wavetable Sound Card
- 33.6Kbps US Robotics Voice/Fax Modem Speaker Phone [FREE upgrade to X2™ 56k]
- 2 USB, Amplified Speakers
- Microsoft® IntelliMouse®
- 104-key Win'95 Enhanced Keyboard
- MS Windows '95 CD
- Internet start-up kit
- 5 Year Parts 1 Year On-Site Warranty
- 15" Flat Screen NI Monitor

TITANA 166VL \$1499

TITANA 166VA

\$1299 *As Low as \$50/mo.

- Intel® Pentium III 166MHz processor
- 16MB EDO RAM, Intel® 430TX Chipset
- 512KB Pipelined Burst Cache, Flash BIOS
- Tool-Free Tower or Desktop Case
- Ultra DMA/33 IDE controller
- 1.2GB EIDE IDE Hard Drive
- 24x Toshiba EIDE CD-ROM • 3.5" FDD
- Matrox Mystique 220 2MB SGRAM Video
- 3COM 10V100m bps
- 2 Universal Serial Bus
- Microsoft® IntelliMouse®
- 104-key Win'95 Enhanced Keyboard
- MS Windows '95 CD
- 5 Year Parts 1 Year On-Site Warranty
- 15" Flat Screen NI Monitor

TITANA 200VA \$1349

TITANA 133VA \$1279

Our Convenient Business Hours are: 9am-Midnight Monday thru Friday
9am-7pm Saturdays and Sunday (Eastern Standard Time).

1-800-731-6526

Unicent Technologies is proud to feature quality components by these manufacturers

ENSONIQ

matrox

Quantum
CAPACITY FOR THE EXTRAORDINARY

US Robotics
The World's Best Voice/Fax Modem

TOSHIBA



CIRCLE 055 ON READER SERVICE CARD

**MOST SYSTEMS
WILL BE
SHIPPED IN
48HRS**

CONFIGURE YOUR UNIQUE
SYSTEM ANY WAY YOU WANT
WITH ANY OF THESE GREAT
OPTIONS:

- Iomega Zip Drive IDE int.
w/ 100MB Cartridge **\$99**
- Iomega Jaz Drive SCSI int.
w/ 1GB Cartridge **\$299**
- 3.2GB Travan Tape Backup
w/ Tape **\$189**
- APC Back-UPS PRO 280 **\$149**
- APC Back-UPS PRO 650 **\$299**
- For Microsoft® Natural Keyboard
int **\$49**

• For Sound System w/ Subwoofer
add **\$99**

• For Windows NT 4.0 Workstation
add **\$99**

• 3COM Fast Etherlink 10/100
Ethernet Card **\$89**

UNIWARRANTY

- 30-Day Unconditional 100%
Money-Back
- Five-Year Parts and Three-Year
Labor Warranty.
- First Year of On-Site Service
Included.
(Three-Year contract add \$99)
- 24-Hour, 7 days a week Toll-free
technical support:
800-731-6182

unicent
TECHNOLOGIES

We put the personal back into personal computers.

290 LENA DRIVE, AURORA, OHIO 44202

1 800 731 6526 • TOLL FREE

216-344-2649 • International Sales

800-731-6159 • Executive De Ventas Hispanos

800-731-6182 • Technical Support

216.344.2647 • FAX

<http://www.unicent.com>



C.O.D. UPS

All Prices and Specifications Subject to Change Without Notice
Unicent Technologies cannot be responsible for any alterations, errors in typography or photography • All Returned Items Must Have RMA #, and Must Be in Original Packaging • Shipping Charges, Custom Software and Custom Configured Systems are non-refundable • Absolutely no refunds for merchandise returned after 30 days • Government, School, and Corporate Purchase Orders are always welcome • For More Information On Warranty & Policy Please Call • On-Site Service is a non-refundable option • All logos and brand names are trademarks of their respective companies • *Business Loans payments are based on 36 months for market value loans and do not include shipping/handling or applicable taxes. Lease rates are subject to change without notice or obligation.

particular driver or command is causing problems. You can also use the troubleshooter for temporarily disabling the services that automatically start when you turn on your PC. The only way to disable these services in Windows 95 is via the Registry Editor, a very complicated utility.

Finally, the new System File Checker lets you take a "snapshot" of a working Memphis configuration. It keeps a log of all current software versions and system files, and if something changes, it can help restore your configuration. For example, when you install a new application that changes your communications driver, the checker will let you restore the old driver if you have any problems. The checker will also make a backup of the new driver in case you ever need it.—SR

System Plumbing

Memphis carries numerous enhancements under the covers.

In particular, its support for so much new hardware will make it the OS of choice for cutting-edge systems. Memphis also enhances some system-level software for controlling devices, most prominently by making FAT32 respectable. The other major new system software feature is the Win32 Driver Model.

Notebook users especially will find Memphis's support for portable features appealing. Memphis supports not only Advanced Power Management (APM) 1.2, which allows for multiple batteries

and wake-on-modem-ring, but also the more forward-looking Advanced Configuration and Power Interface (ACPI).

ACPI is OS-based, not BIOS-based, and is itself the basis for another Memphis innovation, OnNow. This collection of standards for systems and applications is designed to make computers behave more like consumer appliances—that is, like your stereo: When you turn on your PC, it's on, instead of taking several minutes to boot. Notebook users also will like the support for CardBus, a 32-bit PCMCIA card with higher data rates and lower voltages than standard PCMCIA cards.

Memphis includes built-in support for the array of new hardware standards—AGP, DVD, FireWire, and USB. Windows 95 users likely will be able to use all these cool new devices with additional

Should You Upgrade to Memphis Now?

Most people get their new versions of Windows by buying new computers. But if your PC upgrade cycle is not in sync with Microsoft's OS development cycle, you'll be wondering whether you should upgrade to Memphis before you get a new computer sometime in 1998 or beyond. Your decision will hinge on whether you need more from Memphis than what the IE 4.0 portion already delivers for free.

So if a better browser, Active Desktop, improved clients for mail and news, and integration of the Web metaphor with your desktop and hard disk already do it for you, then Memphis, no matter the cost, is probably not worthwhile for now.

If the non-IE 4.0 features of Memphis strike a chord for you, though, you'll still need to weigh them against the real pain of an OS upgrade. Arguably, Memphis contains no one killer feature beyond what IE 4.0 offers. Yet its smaller enhancements are numerous and worth considering, especially if your system has the original Windows 95 without

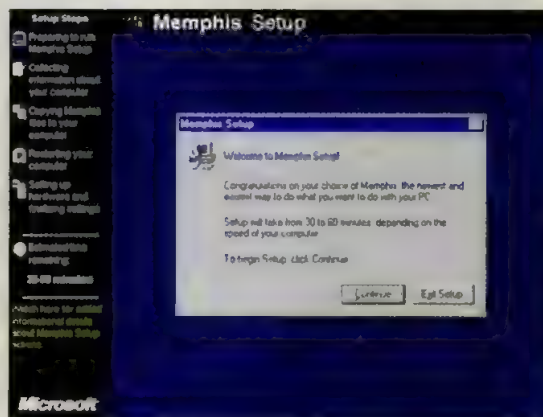
many of its bug fixes.

One hot button for you may be support for new hardware, of which Memphis has plenty out of the box. If you plan on using some of the new Accelerated Graphics Port (AGP), DVD, FireWire (IEEE 1394) or USB devices, an ACPI-compliant notebook, or even multiple monitors, you'll see better driver support in Memphis. Analogous enhancements are available in the networking client, and although that support is also available as a patch to Windows 95, integration in the OS is always preferable.

Have you been waiting for FAT32? It's been in Windows 95 since OEM Service Release 2 (OSR2), but Memphis is the first version to provide a user conversion to this format. For some users, FAT32's potential benefits—being able to take advantage of Microsoft's Disk Defragmenter Optimization Wizard effectively and its significant hard disk space savings—are worth the upgrade. But the effectiveness of these features will vary for different users depending on the programs on their systems and whether a given hard disk is full of large files or small files.

The Windows 95-to-Memphis upgrade process itself is not always easy. We've tried it out on several systems. It went well on some of them, miserably on others. Beta testers should be prepared for installation difficulties.

The bottom line: Take Microsoft at its word when it recommends that you back up your system first. And before you begin, make sure you really need more than just the browser and a new desktop interface.—LS



Moving to Memphis from Windows 95 ran smoothly on some test systems and less well on others.

We're Bustin' Loose...



GATEWAY2000

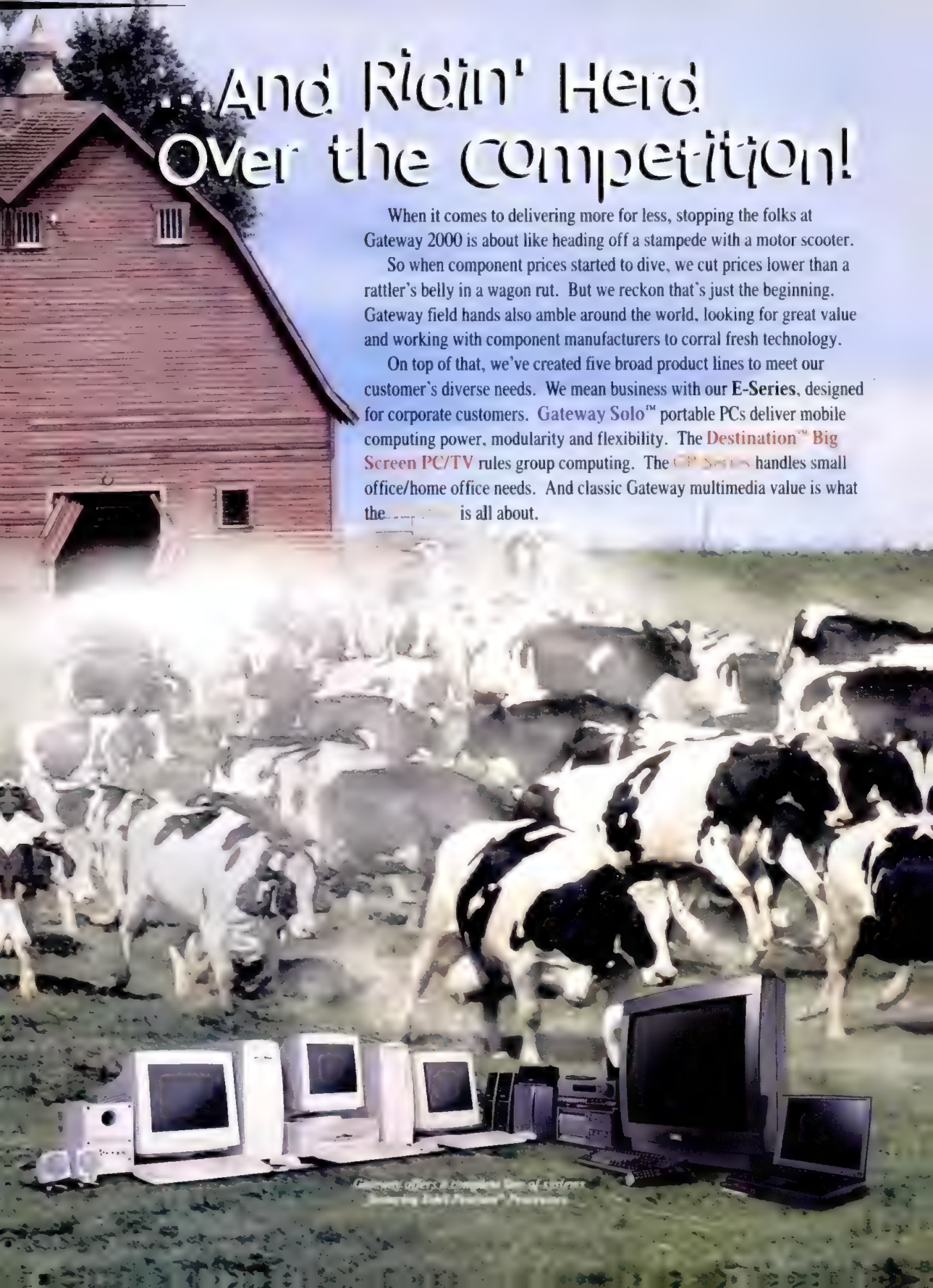
"You've got a friend in the business."

...And Ridin' Herd Over the Competition!

When it comes to delivering more for less, stopping the folks at Gateway 2000 is about like heading off a stampede with a motor scooter.

So when component prices started to dive, we cut prices lower than a rattler's belly in a wagon rut. But we reckon that's just the beginning. Gateway field hands also amble around the world, looking for great value and working with component manufacturers to corral fresh technology.

On top of that, we've created five broad product lines to meet our customer's diverse needs. We mean business with our **E-Series**, designed for corporate customers. **Gateway Solo™** portable PCs deliver mobile computing power, modularity and flexibility. The **Destination™ Big Screen PC/TV** rules group computing. The **CP Series** handles small office/home office needs. And classic Gateway multimedia value is what the _____ is all about.



Quality And Service Wear Our Brand

If you see the Gateway mark branded into the hide of anything, you know it's been tested more times than a bull rider in August and backed by customer service pros who know the business end of a chip set.

Once you join the Gateway customer family, the relationship is only beginning. You'll have a technical support friend just a toll-free phone call away, 24 hours a day.

We back our systems with a three-year limited warranty on desktops and one-year limited warranty on portables. Call or write for a free copy. Or you can upgrade to Gateway Gold™ premium service and support and add two years onto the standard one-year on-site service agreement** included with desktops, and get three years of priority access to technical support phone lines.

Highest Brand Loyalty, Bar None

No wonder an IDC/ACNielsen survey of computer owners showed Gateway had the highest brand loyalty of any computer maker in the U.S. home market, even better than those guys with the fruit logo.

Give Gateway a holler today and get in on the stampede of value. We'll be glad to cut one from the herd and deliver it to your door.



GATEWAY2000

"You're got a friend in the business."

800-555-2087

www.gateway.com

New In These Parts?

Not only does Gateway ride herd on the PC stampede for our customers, we're always looking for new things worthy of the Gateway brand that can drive your PC productivity and enjoyment to a whole new level.

Because we talk to about 30,000 customers a day, Gateway has a unique perspective on what folks want in their computers. But we're only getting warmed up. We also ask Gateway employees who market, build, sell and service our PCs what they think customers would like.

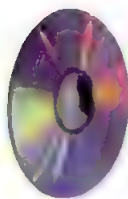
With all that information, we hunker down with customer survey research and huddle with our vendor allies to anticipate when new technology will come onto the market.

It's all about looking six months or more down the road and lining things up to make it easy for our customers to get the latest technology. Take a gander at the new features we're offering and give us a call.



DVD (Digital Versatile Disc)

The new multimedia sheriff goes by the initials DVD, and is fixin' to create a whole new standard throughout the computer territories. Now Gateway gives you the option of including this heir apparent to CD-ROM in your next computer. One Digital Versatile Disc holds 4.7GB of data, a veritable sprawling data prairie that's seven times the size of a CD, room enough for up to 133 minutes of video that makes your VCR tapes seem as fuzzy as the Badlands in a duststorm.



EV900 Monitor

A while back, we saddled up some jet airplanes and searched the world for a better monitor. First we found a great monitor tube. Custom designed a case around it. The resulting EV900 is a 19-inch monitor (18-inch viewable) that takes up about the same space on your desktop as our 17-inch monitor (15.9-inch viewable) without skimping on quality.



Boston Acoustics® Speakers

What good is great multimedia if your computer has speakers as tired as a draft horse on Saturday? We sat a spell with the folks at Boston Acoustics and found a way to bring their award-winning sound to our PCs. Gateway yokes these great speakers to some mighty fine sound cards to break new PC audio ground.



Pentium® II Processor

More powerful than a galloping buffalo, more agile than a Black Hills mountain lion. The Intel Pentium II processor combines optimum 32-bit performance and MMX™ technology at speeds that reach 300MHz. Gateway worked with Intel to round up a supply of Pentium II processors for our customers' homes *and* offices.



Gateway Solo™ Portable Modularity

Our portable components are modular. That means many of them can be swapped between different Gateway Solo portables. Now you can mix and match one set of batteries, AC power packs and memory chips between several 2300 and 9100 portables. More flexible than a well-oiled lasso and twice as sleek.



8 0 0 - 5 5 5 - 2 0 8 7

www.gateway.com

Prairie Value, City Savvy

When you grow from nothing to \$5 billion in 11 years, you tend to know what it takes to run a business. Experience from our own amazing growth and suggestions from our customers, sales groups and manufacturing teams led to our GATEWAY™ E-Series PCs. After we designed the series, we put it through extreme network environment tests. Geared just for business, education and government customers, the E-Series line kicks up its heels with:

Manageability — DMI-compliant PCs let your IS team know what's going on without popping the case.

Product Stability — Nothing more annoying than having skitterish PC vendors constantly changing their base platforms. Gateway's solid platforms let you standardize on a configuration that fits your unique needs. Then you can manage technology upgrades when they make sense for your particular outfit.

Serviceability — Easy-open cases let you get into our systems in a flash. And our team of highly trained, dedicated technical support pros are ready around the clock just in case you need the digital cavalry.

Flexibility — As with all Gateway PCs, you make the decisions on what goes into your E-Series systems. Your sales rep will listen to your needs and help you find a configuration that gets it done. You call the shots at Gateway 2000.

Call your Gateway 2000 Major Accounts Sales rep today and we'll charge toward your business goals like a herd of bulls. We mean business.



Custom Integration Services — Say your corporation uses a specific inventory control program or certain type of backup storage device. For volume purchasers, Gateway's CIS crew can help you get some of that hardware or software built into your new systems, pre-tested and shipped to your door. It doesn't matter if we normally sell it or not. That means you don't have to pay any other outfit to add hardware and software to your Gateway systems. They come right to your corral ready to go to work.

Gateway E-Series PCs

- Intel Pentium® Pentium® Pro or Pentium® II Processors
- High-Performance SCSI, EIDE or Ultra ATA Hard Drives
- 2-D or 3-D Video Adapters
- Pre-installed High-Bandwidth Network Options
- Low Profile, Desktop or Mid-Tower Case
- Pre-loaded with Microsoft® Windows® or Windows NT® Workstation 4.0
- Hardware Management Features
- Desktop Management Interface (DMI) 1.1 Compliant
- Gateway Gold™ Service and Support for Desktop PCs

Prices starting at **\$929** (Quantity 1)

Gateway Extras

(All available to existing and new Gateway customers with system purchase.)

- **16-Bit Token Ring Adapter \$149**
3Com® PCI 10/100 TP Adapter **\$49**
(both upgrades from ISA TPO 10BASE-T Adapter)

- **MS® Windows NT Client 4.0 Upgrade \$99**

- **3.2GB Ultra ATA Hard Drive**
6.4GB Ultra ATA Hard Drive
(Call for upgrade pricing.)

- **Printers** *(Call for information and pricing.)*

- **Customized Service Options**
(Call for information and pricing.)

Please call for current pricing on RAM and other upgrades.



8 0 0 - 7 7 9 - 2 0 0 0

www.gateway.com/majoract/majoract.htm

Computing That's At Home On The Range

Gateway Solo portable PCs are thundering through the mobile computing world, leaving a flutter of blue ribbons and trophies in their wake.

When Gateway's mobile PC crew designed our flagship Gateway Solo 9100 portable they had one priority: features. The result is a portable loaded for bear with features normally found only in desktop PCs. If you're looking for a more classic mobile PC, the 2300 line delivers plenty of power and performance. It's ideal for the corporate fleet. The 2100 fits mobile users like college students who want a lot of computer for a little money.

No matter which portable fits your needs, with Gateway you get:

Modularity — Besides being loaded, Gateway Solo 9100 portables can swap many components with their counterparts in the 2300 series. Now IS can buy one supply of components interchangeable with the entire fleet of 2300 and 9100s. Modularity also helps protect your investment with easily changeable components.

Choices — Not only does Gateway have multiple lines of mobile PCs, but you'll never get some pre-built portable that's been sitting on a shelf. Gateway customers decide what goes into their mobile PCs and then we build them fresh and ship them out.

Fresh technology — No hand-me-downs from the desktops here. Gateway gets the freshest mobile PC components on the market and only builds your Gateway Solo portable PC after you order it.

Slip a Gateway Solo portable PC into your saddle bag and you're ready for the road, no matter where you're going.

*Maximum data transfer rate dependent on certain variables including particular modems with which you are communicating, telephone lines, communications software and communications protocols



Gateway Solo™ Portable PCs

2100SE

- 11.3" SVGA DSTN Color Display
- Intel® 133MHz Pentium® Processor
- 16MB EDO DRAM (expandable to 72MB)
- 256K Pipelined Burst Cache
- 1MB EDO Video RAM
- Modular 6X min/11X max CD-ROM Drive
- Modular 3.5" Diskette Drive
- Zoomed Video
- 1.3GB Hard Drive
- 16-Bit Sound & Stereo Speakers
- NiMH Battery & AC Pack
- 85-Key MS® Windows® 95 Keyboard
- EZ Pad® Pointing Device
- Casual Carrying Case
- Microsoft® Windows 95
- MS Works 95
- Gateway Gold™ Service & Support for Portable PCs

\$1899 As low as* \$66/mo.

2300LS

- 12.1" SVGA TFT Color Display
- Intel 150MHz Pentium® Processor with MMX™ Technology
- 32MB SDRAM (expandable to 192MB)
- 256K Pipelined Burst Cache
- 1.15MB Integrated Video RAM
- Modular 8X min/11X max CD-ROM Drive
- Modular 3.5" Diskette Drive
- USB Ports & Zoomed Video
- NTSC/PAL Video Output
- 3GB Hard Drive
- 16-Bit Wavetable Sound & Stereo Speakers
- PCMCIA Data/14.4 Fax Modem™
- 12-Cell Li-Ion Battery & AC Pack
- 85-Key MS Windows 95 Keyboard
- EZ Pad Pointing Device
- Casual Carrying Case
- MS Windows 95 & MS Office 97, Small Business Edition plus Encarta® 97
- Gateway Gold Service & Support for Portable PCs

\$3849 As low as* \$134/mo.

9100XL

- ▶ 13.3" (1024 x 768 resolution) TFT Color Display
- Intel 166MHz Pentium Processor with MMX Technology via IMM® Package
- 64MB SDRAM (expandable to 192MB)
- 256K Pipelined Burst Cache
- ▶ 4MB EDO Video RAM (1280 x 1024 external)
- USB Ports & Zoomed Video
- ▶ Removable Combo 8X min/11X max CD-ROM & 3.5" Diskette Drive (allows for second battery pack)
- Two 12-Cell Lithium Ion Batteries & AC Pack
- NTSC/PAL Video Input & Output with frame capture capability
- 5GB Hard Drive
- Premium Sound System with 16-Bit Wavetable Sound & Yamaha Stereo Speakers
- PCMCIA Modem with x2 Technology™
- Full 88-Key MS Windows 95 Keyboard with 19mm pitch & 3mm travel
- EZ Pad Pointing Device
- 15-Pin MIDI/Game Port
- Carrying Case
- MS Windows 95 & MS Office 97, Small Business Edition plus Encarta 97
- Gateway Gold Service & Support for Portable PCs

9100XL \$5699 As low as* \$198/mo.

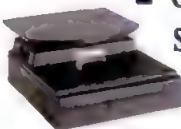
9100LS \$4699 As low as* \$163/mo.

(150MHz Pentium processor with MMX Technology, 2GB Hard Drive, 32MB SDRAM and One Li-Ion Battery)

Gateway Extras

(Some items only available to new or existing Gateway customers or with the purchase of a system.)

- Gateway Solo Docking Station **\$599**



- Gateway Solo Mini Docking Station **\$199**



- Additional 2300/9100 Lithium-Ion Battery **\$200** (with system purchase)

- Canon® BJC®-70 Color Bubble Jet Printer **\$299**



Please call for current pricing on RAM and other upgrades.



8 0 0 - 5 5 5 - 2 0 8 7

www.gateway.com

Gateway Solo Portable PCs For The Road

Bigger Than All Outdoors

Hailing from South Dakota, wide open spaces have always attracted Gateway. So it's no wonder we invented a whole new computer category by introducing the Destination Big Screen PC/TV in April 1996.

Its huge 31-inch monitor, wireless keyboard and Field Mouse remote make the Destination Big Screen PC/TV a system born and bred for group use. And, with a click of the mouse button, the Destination system becomes a fully functional television. The Destination Big Screen PC/TV includes options like the power of a **Pentium® II** processor and the amazing digital video of DVD. Custom configure one to fit your needs and yank computing out of the den and into the:

Family room — Computing and exploring the Internet just became group activities. After a year on the market, 61% of Destination system owners we surveyed said they spent more time with their families as a result of the Destination Big Screen PC/TV.

Conference room — Now you can combine the presentation power of a big screened computer with the functions of a video system. Add your video cassette player, cable TV hookup and phone line and you've got one system that does it all, at a price that will let you outfit all your conference rooms.

Classroom — How do you teach computer-based lessons to a class? The screen size of a traditional desktop made it tedious at best. Now educators can wheel the Destination Big Screen PC/TV to the head of the class and give all students a great view. And Gateway value delivers a lot without consuming the ever-shrinking budget.



GATEWAY™ Destination™ Big Screen PC/TVs

D5-166

- Intel® 166MHz Pentium® Processor with MMX™ Technology
- 32MB SDRAM
- 512K Pipelined Burst Cache
- Destination 31" VGA Monitor
- 2MB Graphics Accelerator w/ Cable-Ready TV Tuner
- 2GB 10ms Ultra ATA Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Ensoniq® Wavetable Audio
- ▶ Boston Acoustics® MicroMedia™ Speakers
- TelePath® Modem for Windows with x2™ Technology**
- 7-Bay Charcoal-Colored PC Case
- Wireless Keyboard w/ Integrated EZ Pad® Pointing Device
- Wireless Field Mouse® Remote
- Microsoft® Windows® 95
- Home Software Gallery
- Gateway Gold™ Service & Support* for Big Screen PC/TVs

D5-166 \$2499 As low as* \$87/mo.

D5-200 \$2999 As low as* \$104/mo.

(200MHz Pentium Processor with MMX Technology, 4GB Hard Drive, DVD-ROM Drive and DVD Decoder)

D6-233

- Intel 233MHz Pentium® II Processor with 512K Cache
- 32MB EDO DRAM
- Destination 31" VGA Monitor
- 2MB Graphics Accelerator with Cable-Ready TV Tuner
- 6.4GB 10ms EIDE Hard Drive
- ▶ DVD-ROM Drive & DVD Decoder Card
- 3.5" Diskette Drive
- Ensoniq Wavetable Audio
- ▶ harman/kardon® High-Fidelity Sound System
- TelePath Modem for Windows with x2 Technology**
- 7-Bay Charcoal-Colored PC Case
- Wireless Keyboard w/ Integrated EZ Pad Pointing Device
- Wireless Field Mouse Remote
- MS® Windows 95
- Home Software Gallery
- Gateway Gold Service & Support* for Big Screen PC/TVs

\$3999 As low as* \$139/mo.

*The Destination 31-inch monitor is covered by a one-year limited warranty. Call or write for a free copy.

D6-300XL

- Intel 300MHz Pentium II Processor with 512K Cache
- 64MB EDO DRAM
- Destination 31" VGA Monitor
- 2MB Graphics Accelerator with Cable-Ready TV Tuner
- 6.4GB 10ms EIDE Hard Drive
- ▶ DVD-ROM Drive & DVD Decoder Card
- 3.5" Diskette Drive
- ▶ EasyPhoto Drive™ Photo Scanner
- Ensoniq Wavetable Audio
- ▶ harman/kardon High-Fidelity Sound System
- TelePath Modem for Windows with x2 Technology**
- 7-Bay Charcoal-Colored PC Case
- Wireless Keyboard w/ Integrated EZ Pad Pointing Device
- Wireless Field Mouse Remote
- MS Windows 95
- Home Software Gallery
- Gateway Gold Service & Support* for Big Screen PC/TVs

\$4699 As low as* \$163/mo.

Gateway Extras

(Some items only available to new or existing Gateway customers.)



- Logitech™ WingMan® Extreme™ Joystick **\$39**

- Additional Destination 31-inch VGA Color Monitor **\$999**

- EasyPhoto Drive Photo Scanner **\$149** (with system purchase)

- Epson® PhotoPC™ 500 Digital Camera **\$499**



Please call for current pricing on RAM and other upgrades.



8 0 0 - 5 5 5 - 2 0 8 7

www.destination.com

Destination Big Screen PC/TVs For Group Computing

Big Systems For Small Operations

The GATEWAY™ GP-Series professional PCs aim to deliver one system that can do many things for small and medium-sized business. Head-of-the-pack technology lets our GP-Series PCs take care of everything from inventory to accounting. We deliver MMX™ technology across the line and options that include the Pentium® II processor, huge backup storage devices and software that can boost business productivity. The GP-Series systems tackle your business needs like a steer wrestler in the championship go-round.

You Call The Shots — Because you know more about your business needs than anyone, you decide what goes into your GP-Series system. Our sales representatives can help you assess your needs and explain your options. But you make the final call.

Fresh Technology — Intel Pentium processors with MMX technology can take care of your business needs, thanks to our philosophy of combining them in fresh configurations. Things like 512K cache, plenty of RAM and Ultra ATA hard drives up to 6.4GB make Pentium processors perfect for your small office/home office needs.

Software That's Part Of The Deal — Gateway knows hardware is just part of the bargain. You also need software and we've got it in standard and optional packages. So while some companies charge you extra for the basics like anti-virus software and productivity programs, Gateway throws them in with the system, no extra charge.



Gateway GP-Series PCs for the Office Professional

GP5-166

- Intel® 166MHz Pentium® Processor with MMX™ Technology
- 32MB SDRAM
- 512K Pipelined Burst Cache
- CrystalScan®500 .28 Screen Pitch 15" Monitor (13.9" viewable)
- 2MB 3-D 64-Bit PCI Graphics
- 2GB 10ms Ultra ATA Hard Drive
- 12X min/16X max CD-ROM & 3.5" Diskette Drives
- Desktop Case
- 104* Keyboard & MS® IntelliMouse™
- Microsoft® Windows® 95 & MS Office 97, Small Business Edition plus Encarta® 97
- Gateway Gold™ Service & Support for Desktop PCs

\$1449 Business Lease* \$54/mo.

GP5-200

- Intel 200MHz Pentium Processor with MMX Technology
- 32MB SDRAM
- 512K Pipelined Burst Cache
- CrystalScan500 .28 Screen Pitch 15" Monitor (13.9" viewable)
- 2MB 3-D 64-Bit PCI Graphics
- 2GB 10ms Ultra ATA Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Desktop Case
- 104* Keyboard & MS IntelliMouse
- MS Windows 95 & MS Office 97, Small Business Edition plus Encarta 97
- Gateway Gold Service & Support for Desktop PCs

\$1799 Business Lease* \$66/mo.

GP6-233

- Intel 233MHz Pentium® II Processor with 512K Cache
- 64MB EDO DRAM
- CrystalScan700 .28 Screen Pitch 17" Monitor (15.9" viewable)
- 4MB 3-D 64-Bit PCI Graphics
- 4GB 10ms Ultra ATA Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Mid-Tower Case
- 104* Keyboard & MS IntelliMouse
- MS Windows 95 & MS Office 97, Small Business Edition plus Encarta 97
- Gateway Gold Service & Support for Desktop PCs

\$2499 Business Lease* \$92/mo.

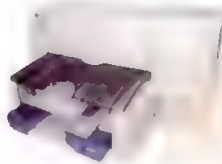
GP6-266

- Intel 266MHz Pentium II Processor with 512K Cache
- 64MB EDO DRAM
- ▶ EV900 .26 Screen Pitch 19" Monitor (18" viewable)
- 4MB 3-D 64-Bit PCI Graphics
- 6.4GB 10ms Ultra ATA Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Mid-Tower Case
- 104* Keyboard & MS IntelliMouse
- MS Windows 95 & MS Office 97, Small Business Edition plus Encarta 97
- Gateway Gold Service & Support for Desktop PCs

\$2999 Business Lease* \$110/mo.

Gateway Extras

(Some items only available to new or existing Gateway customers or with the purchase of a system.)



- Hewlett®-Packard DeskJet 820Cse Color Printer **\$299**
- TR4 IDE 4GB Tape Backup Unit with Tape **\$199** (with system purchase)
- TelePath® Modem for Windows with x2™ Technology** **\$79**
- Iomega® Internal ZIP™ Drive with Two Discs **\$99** (with system purchase)

Please call for current pricing on RAM and other upgrades.



8 0 0 - 5 5 5 - 2 0 8 7

www.gateway.com

GP-Series PCs For The Office Professional

High-Tech Multimedia, Down-Home Values

No sense in making things complicated. Give customers fresh technology at amazing prices. That's the long and the short of GATEWAY™ G-Series multimedia PCs. These systems deliver the latest multimedia wonders, including MMX technology priced for everyone and the unbeatable value of the amazing **Pentium® II** processor.

Business That Has The Groundwork On Lock

By refusing to build even one system before someone orders it and keeping our component inventory among the freshest in the industry, we've spooked our competitors for years.

Gateway constantly searches for the greatest deals on the latest technology, like the **300MHz Pentium II** processor. Then we pack our systems with value and wrap our desktop systems in a three-year limited warranty and one-year on-site service agreement.**

Selected G-Processors Feature MMX Technology, DVD Video

When the **Pentium II** processor was coming out, we took a look-see and discovered this processor was a great deal for *everyone*. So we worked with Intel to secure a processor pipeline so we could deliver for our customers. We moseyed around the globe and found a way to lasso DVD-ROM drives. Same deal on the breakthrough EV900 monitor and the pristine sound of Boston Acoustics speakers.

Large Screen? Small Budget? We've Got You Covered!

Looking for something to ease yourself into the computing world or to use as a second system? No problem. Check out the G5-166 multimedia PC complete with printer for \$1,599. No matter what your needs or budget, we've got a system that fits.

We're always out there, looking for the great deals and the next technology that will benefit our customers. It's all part of leading the multimedia computing stampede.



Gateway G-Series Multimedia PCs for the Home

G6-233

- Intel® 166MHz Pentium® Processor with MMX™ Technology
- 16MB SDRAM
- 512K Pipelined Burst Cache
- CrystalScan®500 .28 Screen Pitch 15" Monitor (13.9" viewable)
- 2MB 3-D 64-Bit PCI Graphics
- 2GB 10ms Ultra ATA Hard Drive
- 12X min/16X max CD-ROM & 3.5" Diskette Drives
- Ensoniq® Wavetable Audio
- Altec™ Lansing ACS-41 Speakers
- TelePath® Modem for Windows with x2™ Technology**
- Desktop Case
- 104* Keyboard & Microsoft® Mouse
- MS® Windows® 95 & Home Software Bundle
- Color Ink Jet Printer
- Gateway Gold™ Service & Support for Desktop PCs

\$1599 As low as* \$56/mo.

G6-200

- Intel 200MHz Pentium Processor with MMX Technology
- 32MB SDRAM
- 512K Pipelined Burst Cache
- CrystalScan700 .28 Screen Pitch 17" Monitor (15.9" viewable)
- 2MB 3-D 64-Bit PCI Graphics
- 2GB 10ms Ultra ATA Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Ensoniq Wavetable Audio
- Altec Lansing ACS-41 Speakers
- TelePath Modem for Windows with x2 Technology**
- Desktop Case
- 104* Keyboard & MS IntelliMouse™
- MS Windows 95
- Generations III Software Collection
- Gateway Gold Service & Support for Desktop PCs

\$1899 As low as* \$66/mo.

G6-233

- Intel 233MHz Pentium® II Processor with 512K Cache
- 32MB EDO DRAM
- CrystalScan700 .28 Screen Pitch 17" Monitor (15.9" viewable)
- 4MB 3-D 64-Bit PCI Graphics
- 4GB 10ms Ultra ATA Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Ensoniq Wavetable Audio
- Boston Acoustics® MicroMedia™ 3-Piece Speaker System
- TelePath Modem for Windows, with x2 Technology**
- Mid-Tower Case
- 104* Keyboard & MS IntelliMouse
- MS Windows 95 & MS Office 97, Small Business Edition plus Encarta® 97
- MMX Technology-Enhanced Software
- Gateway Gold Service & Support for Desktop PCs

G6-233 \$2549 As low as* \$89/mo.

G6-266 \$2999 As low as* \$104/mo.

(266MHz Pentium II Processor, EV900 Monitor and 6.4GB Hard Drive)

G6-300X1

- Intel 300MHz Pentium II Processor with 512K Cache
- 64MB EDO DRAM
- EV900 .26 Screen Pitch 19" Monitor (18" viewable)
- 4MB 3-D 64-Bit PCI Graphics
- TV/FM Tuner Card
- 6.4GB 10ms Ultra ATA Hard Drive
- DVD-ROM Drive & DVD Decoder Card
- 3.5" Diskette Drive
- Ensoniq Wavetable Audio
- Boston Acoustics MicroMedia 3-Piece Speaker System
- TelePath Modem for Windows with x2 Technology**
- Tower Case
- 104* Keyboard & MS IntelliMouse
- MS Windows 95 & MS Office 97, Small Business Edition plus Encarta 97
- MMX Technology-Enhanced Software
- Gateway Gold Service & Support for Desktop PCs

\$3799 As low as* \$132/mo.

Gateway Extras

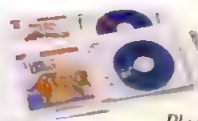
(Some items only available to new or existing Gateway customers or with the purchase of a system.)



- Epson® Stylus® COLOR 400 Ink Jet Printer **\$199**



- MS SideWinder™ 3D Pro Joystick **\$59**



- Education Software Bundle Grades K-3 or Grades 4-8 **\$99 (each)**

Please call for current pricing on RAM and other upgrades.

*On-site service is available to most locations in the continental United States, Alaska, Hawaii, Puerto Rico and Canada after you and your Gateway technician determine an on-site visit is necessary. On-site service is provided by PC Technology Services, Inc. On-site is not available for any monitor, mouse, keyboard, or portable system. Write or call for a free copy of the on-site service agreement.



800-555-2087

www.gateway.com

Barn Burnin' Values

Get more for your money with GATEWAY™ PCs!

Gateway G-Series Multimedia PC

G6-233

- Intel® 233MHz Pentium® II Processor with 512K Cache
- 32MB EDO DRAM
- CrystalScan®700 .28 Screen Pitch 17" Monitor (15.9" viewable)
- 4MB 3-D 64-Bit PCI Graphics
- 4GB 10ms Ultra ATA Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Ensoniq® Wavetable Audio
- ▶ Boston Acoustics® MicroMedia™ 3-Piece Speaker System
- TelePath® Modem for Windows, with x2™ Technology**
- Mid-Tower Case
- 104+ Keyboard & Microsoft® IntelliMouse™
- MS® Windows® 95 & MS Office 97, Small Business Edition plus Encarta® 97
- MMX™ Technology-Enhanced Software
- Gateway Gold™ Service & Support for Desktop PCs

\$2549 As low as* \$89/mo.

Gateway Destination™ Big Screen PC/TV

D5-200

- Intel 200MHz Pentium® Processor with MMX Technology
- 32MB SDRAM DRAM
- 512K Pipelined Burst Cache
- Destination 31" VGA Monitor
- 2MB Graphics Accelerator with Cable-Ready TV Tuner
- 4GB 10ms Ultra ATA Hard Drive
- ▶ DVD-ROM Drive & DVD Decoder Card
- 3.5" Diskette Drive
- Ensoniq Wavetable Audio
- ▶ Boston Acoustics MicroMedia 3-Piece Speaker System
- TelePath Modem for Windows with x2 Technology**
- 7-Bay Charcoal-Colored PC Case
- Wireless Keyboard w/ Integrated EZ Pad® Pointing Device
- Wireless Field Mouse® Remote
- MS Windows 95
- Home Software Gallery
- Gateway Gold Service & Support* for Big Screen PC/TVs

\$2999 As low as* \$104/mo.

Gateway GP-Series Professional PC

GP6-266

- Intel 266MHz Pentium II Processor with 512K Cache
- 64MB EDO DRAM
- ▶ EV900 .26 Screen Pitch 19" Monitor (18" viewable)
- 4MB 3-D 64-Bit PCI Graphics
- 6.4GB 10ms Ultra ATA Hard Drive
- 12X min/24X max CD-ROM & 3.5" Diskette Drives
- Mid-Tower Case
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, Small Business Edition plus Encarta 97
- Gateway Gold Service & Support for Desktop PCs

\$2999 Business Lease* \$110/mo.

Gateway Solo™ Portable PC

9100XL

- ▶ 13.3" XGA TFT Color Display
- Intel 166MHz Pentium Processor with MMX Technology
- 64MB SDRAM (expandable to 192MB)
- 256K Pipelined Burst Cache
- ▶ 4MB EDO Video RAM (1280 x 1024 external)
- USB Ports & Zoomed Video
- ▶ Removable Combo 8X min/11X max CD-ROM & 3.5" Diskette Drive
- Two 12-Cell Lithium Ion Batteries & AC Pack
- NTSC/PAL Video Input & Output
- 5GB Hard Drive
- Premium 16-Bit Wavetable Sound & Stereo Speakers
- PCMCIA Modem with x2 Technology**
- 88-Key MS Windows 95 Keyboard
- EZ Pad Pointing Device
- Deluxe Carrying Case
- MS Windows 95
- MS Office 97, Small Business Edition plus Encarta 97
- Gateway Gold Service & Support for Portable PCs

\$5699 As low as* \$198/mo.

(See portables page for more detailed configuration.)

GSA Schedule #GS-35F-4565G



Toll Free from Canada
800-846-3609



Toll Free from Puerto Rico
800-846-3613



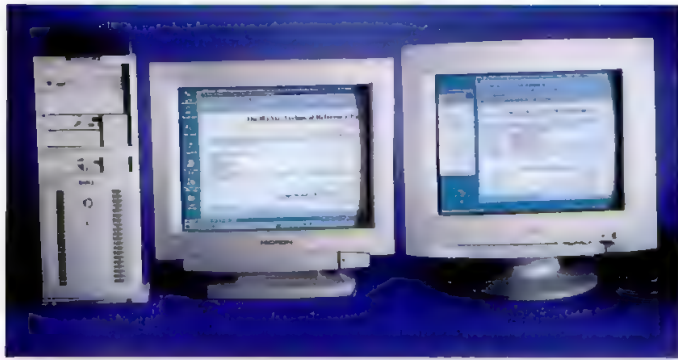
8 0 0 - 5 5 5 - 2 0 8 7

www.gateway.com

610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000
TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 800-846-4526 • International FaxBack Access 605-232-2561
Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 8am-8pm Saturdays & Sundays (CT)



© 1997 Gateway 2000, Inc. GATEWAY 2000, black-and-white spot design, CrystalScan, EZ Pad, Field Mouse, "G" logo, TelePath and "You've got a friend in the business" slogan are registered trademarks, and Destination, GATEWAY, Gateway Gold, Kid's Backpack and Gateway Solo are trademarks of Gateway 2000, Inc. Not all Gateway E-Series PCs, Destination systems, G-Series PCs and GP-Series PCs contain the Pentium II processor. The Gateway Solo PC does not contain the Pentium II processor. The Intel Inside Logo, Intel and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping or applicable sales tax. Many Gateway 2000 products are custom engineered to Gateway 2000 specifications, which may vary from the retail versions of the software and/or hardware in functionality, performance or compatibility. *Financing available on approved credit issued and administered by MBNA America® Bank, N.A. Payments based on 36-month term at an Annual Percentage Rate as low as 14.9%. †Leasing arranged by independent leasing companies to qualified commercial customers. Lease payments based on 36-month term. Lease terms subject to change without notice or obligation.



Memphis has multiple-monitor support, and you can run the monitors with different color depths and resolutions.

software support, but having the support built into the OS is always better.

We tested the USB support in Memphis by plugging in a Kodak Digital Video Camera. Memphis immediately recognized the device and installed the driver for it. It worked the first time.

The Win32 Driver Model is a new way of writing device drivers that also will be supported in the new version of Windows NT. You'll be able to write just about anything (except graphics card drivers) in this way, and device support for both operating systems (especially Windows NT) will improve.

PC Magazine Labs' favorite new feature is the multiple-display support (for up to four displays). We put four PCI graphics adapters in a system and connected monitors to all; all four worked in a virtual layout. From the Control Panel Monitors applet, we could set monitors to be to the left or right of each other. We then could move the mouse or drag windows among the four. The four displays can be set for different resolutions and color depths.

Among many users who might find a multiple-monitor setup useful are applications developers, who tend to work on more than one application simultaneously. Microsoft says that its multiple-monitor support should work with any PCI graphics adapter, and it provides a list of adapters known to work.

We tested seven different PCI graphics adapters, each of which worked in Memphis. However, only two worked in multiple-monitor mode, and they were on the "supported" list. Perhaps Microsoft can improve its support before Memphis ships. You should consult the

"supported hardware" list before you buy a new graphics card for this purpose.

In OEM Service Release 2 of Windows 95, Microsoft introduced FAT32, a variation on the ubiquitous FAT file system that eliminates many of the size limits and inefficiencies

of FAT on large volumes. Because you had to change the disk format in order to achieve FAT32's goals, FAT32 caused utility software (such as antivirus and file defragmentation programs) to fail, and vendors had to create new versions. For that reason, Microsoft allowed only system vendors to install OSR2 and FAT32, thus making it almost impossible for users to upgrade to FAT32, although eventually third parties created utilities to do the conversion.

With Memphis, Microsoft has included a conversion utility that is well done. It first warns the user that certain utilities and BIOS features (such as suspend-to-disk) may fail under FAT32. It then searches your disk for applications that it thinks may fail and projects space savings from the conversion. Because FAT32 can use smaller clusters on large volumes, it can save large amounts of disk space for small files that consume only a small fraction of a cluster. On one of our systems, which had 554MB consumed on a 1.96GB disk, it projected a hard-to-believe savings of 251MB. We were right: In the end, it saved 90MB—still impressive.

The utility reboots the system to DOS mode in order to run the actual conversion, which takes just a few minutes. When the system reboots back to Windows (Memphis), it runs the Windows defrag utility, an astonishingly slow program. Even though the system had been defragmented as FAT16 before the conversion, it took DEFRAG 2 to 3 hours to finish defragmenting our test systems. But all in all, there's a lot to like about Memphis behind the scenes.—LS

Networking Improvements

The key word in Memphis communications and networking is *flexibility*. Memphis gains important capabilities—several proven in Windows NT, such as PPTP and multilink PPP—that add remote-access functions and new ease-of-use connection features.

Microsoft has made some important additions to the Dial-Up Networking function. Users who received an updated, bundled version of Windows 95 in a new PC have a scripting capability that can automate the process of dialing into an ISP or other host. Memphis extends this capability by making it possible to initiate and control a wide variety of dial-up actions, such as calling to update a stored database or sending a system status report. The beta includes a new capability to aggregate communications links, such as two modems or two ISDN adapters, that effectively doubles your throughput. Utilizing this feature is ideal for remote LAN access as an easy way to increase throughput.

In this beta, network administrators receive such gifts as the opportunity to introduce virtual private networking on the client side using the Point-to-Point Tunneling Protocol (PPTP). This lets you set up secure links to Windows NT servers across the Internet. You can access PPTP from a number of places, including the Dial-Up Networking program and the Network Control Panel applet.

Features with long-term implications include several asynchronous transfer mode (ATM) drivers in the protocol menu and improvements to the IP protocol stack. Fast Ethernet precluded the ATM desktop market, but some applications, such as replacement of the office telephone system, might yet propel ATM. The Memphis IP stack has the ability to work with programs—particularly multimedia applications—that can generate a quality-of-service request. This request asks the wide area network for handling without delay; it's particularly useful in ATM and frame-relay networks.

—Frank J. Derfler, Jr. □

WALL STREET

1 IN A FREE MARKET ECONOMY, companies are always competing for capital. In fact, the market has never been more competitive than it is today. This increases the number of specialists needed to trade stocks. It also puts an additional burden on the technology needed to support them.

2 THE TRADING FLOOR is

crowded with specialists. The trading floor is also crowded with big, bulky CRTs that hog energy, take up precious room and throw off a lot of heat. (Besides, as any trader will quickly tell you, it's already "hot" enough on the trading floor.)



3 REPLACING A BIG, BULKY

CRT with a slim flat panel display actually makes room for more traders on the floor. Which is a good thing, since the trading volume on the major exchanges is higher than ever.

Perhaps the first instance where computers are being replaced by people.



On Wall Street at least, it appears that less may actually be more. Replacing big, bulky CRTs with flat panel displays makes room for more traders on the floor. For example, take NEC Technologies' new MultiSync® LCD monitors, including the world's first commercially available 20.1" viewable LCD monitor.

These flat panel displays take up 40% less space and weigh 70% less than a traditional monitor. Size, however, is not all that sets them apart.

The XtraView™ technology enables clear and accurate

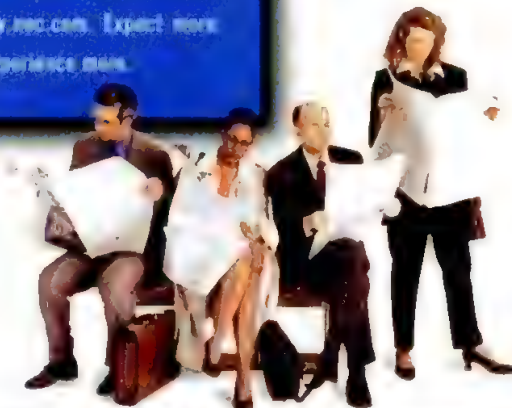
viewing of the screen at virtually any angle. These monitors produce a brighter, sharper image than many CRTs. They eliminate eye-fatiguing flicker. They also consume up to 50% less power and have much lower emissions. Plus, these sleek, thin monitors are compatible with most PCs, Macs and workstations.

To learn more, please call us at 1-800-NEC-INFO. Or visit us at www.nec.com. Expect more. Experience more.

NEC
NEC Technologies

MultiSync LCD Monitor Series		
	LCD2000™	LCD400™
Viewable Size	20.1"	14.1"
Maximum Resolution	1280x1024	1024x768
Weight	22.0 lbs	11.5 lbs
Dimensions (W, H, D)	19.7x19x8.7"	14.1x14.3x6.7"
Brightness	150 cd/m²	180 cd/m²
Viewing Angle	160° conical XtraView technology	160° conical XtraView technology
LCD Type	Active Matrix	Active Matrix
Both models are compatible with PC, Mac, workstation or any VESA compliant analog RGB signal, no special card required.		

4 MORE TRADERS MEANS MORE TRADES, which means more money. (And let's be completely frank, shall we, what financial person doesn't like news like that?) In fact, one could even argue that migrating from big, bulky CRTs to slim flat panel monitors like the MultiSync LCD2000 could actually put a positive spin on the term 'downsizing.'



Webcasting vs. Netcasting

The Browser Push Is On

Microsoft and Netscape are pulling *push* in different directions.

By Scot Finnie

Chances are you've heard and used the phrase "work the Web" to describe the process we all use for tapping online resources that help us save time and increase our productivity. That's about to change. The fourth-generation browsers from Microsoft Corp. and Netscape Communications Corp. include appealing new implementations of push technology that will turn this idea on its head. Soon it will be more like "make the Web work for you."

How and why will this happen? Microsoft and Netscape each have created their own push clients for use in conjunction with their latest browsers, Microsoft Internet Explorer 4.0 (IE 4.0) and Netscape Communicator. Essentially, the push clients are programs that automatically "crawl" out on the Web and download the specific types of information to which you have "subscribed" from various Web sites. Think of this as the difference between picking up a copy of your favorite magazine at the newsstand and having it delivered to your doorstep.

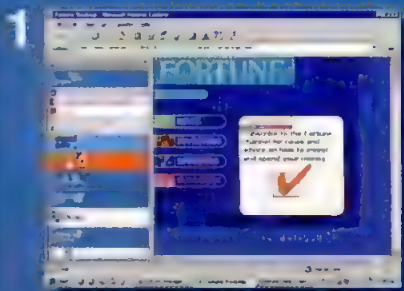
To make the content easier to find, it will be displayed right on your desktop, much of it organized into "channels" using ei-



IN THIS REVIEW

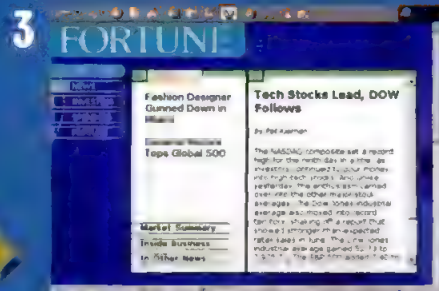
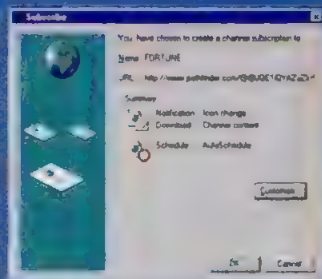
Microsoft's Webcasting and Active Desktop	124	The Politics of Push	128
Netscape's Netcaster	125	Publishing with CDF and Netcaster	128

Tuning In to Internet Explorer



1 Microsoft's premium channel providers are listed by default on the Channel Bar in Internet Explorer 4.0. When you click on a topic, the button expands to display a list of providers in that category. To get more information on the channel—Fortune, in this example—click on the icon in the Channel Bar.

2 When you click on the Subscribe button, Microsoft's Subscribe wizard appears. (IE 4.0 uses nearly identical wizards for subscribing to channels, creating Active Desktop items, and browsing off-line.) The wizard lets you specify how often to update the channel and how you'd like to be notified of changes.



3 Channel content is displayed in a full-screen mode similar to Netcaster's Webtop. All of IE 4.0's browser buttons are at the top of the screen, and you can toggle between full-screen and browser views. You can also display Channels as a screen saver.

ther Microsoft's new Channel Definition Format (CDF) or Netscape's competing Netcaster architecture. Publishers will use dynamic HTML to make channels appear more like traditional broadcast media such as television.

Microsoft uses the term *Webcasting* to describe all of the push features already integrated into IE 4.0. Netcaster, Netscape's push client, is part of the shipping Communicator suite, but users also have to download the small (about 577K) push component separately. Netscape's new SmartUpdate feature makes the process a no-brainer.

At first glance, Microsoft's CDF and Netscape's Netcaster look pretty similar. Both use vertical toolbars on the desktop to display all of the available channels and have buttons for adding and configuring new channels. Both allow you to determine how much content to download and how often to do it. The version of IE 4.0 we tested also displays an icon that notifies you of changes to the content of channels. Netcaster beta 2 did not offer this feature, although Netscape says the next build will have it.

But a look under the hood reveals significant differences between the two. Microsoft relies on its new file type, CDF, to describe the contents of a site and how it should be handled by the push client. This information about content is known as *meta-information*. Netscape has proposed its own meta-information standard,

based on the Meta Content File (MCF) format, although Netcaster does not yet support it. Instead, Netscape argues that the current standards, specifically HTML, Java, and JavaScript, offer enough tools right now to deliver stimulating channels.

Of course, the technology means little without something compelling to push. Microsoft and Netscape may not have all the established providers

of existing push vendors, but each has something even better: an established base of tens of millions of clients. You don't need to do the math to figure out the attraction for content publishers.

The simplicity of Netcaster is attractive, and Netscape's standards-based message will appeal to enterprises that use multiple platforms. On the other hand, Microsoft promises to implement nearly all of its Webcasting features on all platforms that run IE 3.0. And at least for now, Microsoft's CDF clearly offers a more robust push solution that is tightly integrated into the browser and operating system.

The World Wide Web Consortium (W3C) is expected to ratify its own standard for handling meta-information, and

that will greatly affect push. And Netscape is already working on Netcaster 2.0. So don't touch that dial just yet.

Microsoft Corp.

Webcasting and Active Desktop

ALL REVIEWS BY SCOT FINNIE

Microsoft came fashionably late to the push party, but it was worth the wait. The folks from Redmond have put a lot of thought into push technology and how it should work with Microsoft Internet Explorer 4.0 and Windows, and this effort shows in the beta release we previewed.

IE 4.0 can display pushed content in many ways. Channels can be displayed in a regular browser window, in a full-screen mode similar to Netcaster's Webtop, or as a screen saver. Bite-size pieces of information (stock tickers, news summaries, and weather) can be placed anywhere on your desktop. With the Active Desktop, you can turn any Web page into a desktop item.

One of the most impressive aspects of Microsoft's push implementation is that it is accomplished via one

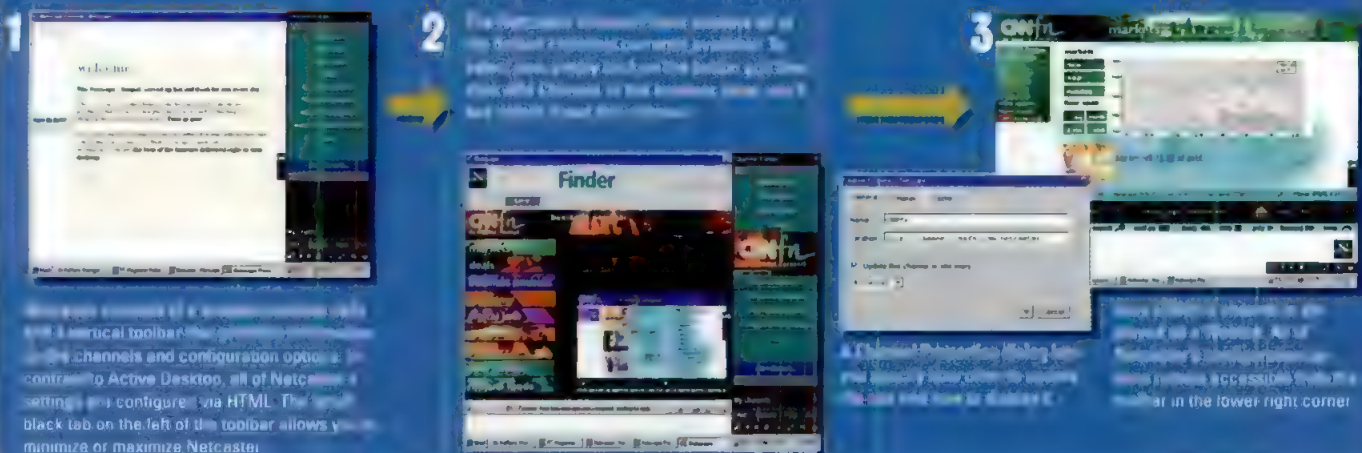
well-designed wizard. Microsoft calls this *subscribing*, and whether you want to tune in to a new channel, place a Web page on your desktop, cache a page for off-line browsing, or get notified when the content changes, the way it works is nearly identical.

www.pcmag.com

Visit our Web site, www.pcmag.com, for the latest information on Microsoft Internet Explorer and Netscape Communicator, plus links to sites where you can download them.

MICROSOFT'S LIST
AudioNet, CBS Sportsline, CMPNet, cnet, CNN Interactive, CNNi, Condenet, Discovery Online, Disney Online, Dun & Bradstreet, ESPN SportsZone, Forbes, Fortune, Hollywood Online, Intuit-Quicken Financial Network, iVillage, Lycos, Microsoft Investor, MSN, MSNBC, MTV Networks, National Geographic, The New York Times, People/Entertainment Weekly, PointCast, Snap Online, Time, Universal Press Syndicate, Wall Street Journal Interactive Edition, Warner Bros., Wired Digital, ZDNet.

Tuning In to Netcaster



The Subscribe wizard lets you choose how much content you'd like to download, create custom schedules for updating it, and enter a user name and password if the site requires. An Advanced Download Option dialog lets you choose whether to download bandwidth-guzzling media types (sound, video, ActiveX controls, and Java applets), as well as restricting downloads to pages in the site's domain. Netcaster simply can't match this.

IE 4.0 keeps track of your channel subscriptions in the Channel Bar column. Although you can add any site with a CDF file to the Channel Bar, Microsoft's premier providers will be listed by default.

The possibilities for customizing the Microsoft Active Desktop are intriguing, and the tight integration with the Windows shell makes it easy. To add a new page to your desktop, just drag and drop the icon in the browser's URL window to your desktop. This desktop integration will not carry over to versions of IE for other platforms, but the rest of the Webcasting features should appear in Windows 3.1, Macintosh, and Unix versions.

Finally, IE 4.0's Webcasting relies on a new CDF format that, from a standards perspective, is currently not as appealing as Netcaster's use of HTML, Java, and JavaScript. But Microsoft has published the CDF spec and submitted it to the W3C. And

since CDF is relatively simple, it shouldn't pose a major hurdle for most publishers.

For end users running Windows 95 or Windows NT, Microsoft's Webcasting is a powerful push solution.

www.microsoft.com/ie/ie40/content

Netscape Communications Corp.

Netcaster

Netscape was first out of the gate with push partners. In its last public beta release, Netcaster let you tune in to about 20 default Web content channels. Add to that Netcaster's support for Marimba's Castanet application channels and you have a potent mix of push with broad appeal.

Netcaster is part of the Communicator suite (\$59 list, standard edition). To run it, you must download a separate component with the necessary HTML and Java code.

The primary interface for Netcaster is an HTML-based vertical toolbar, which serves as a menu of available channels, a list of your channels, a navigation toolbar, a configuration tool, an off-line browser, and more. When you open a channel, the Netcaster bar automatically slides out of the way.

Netcaster offers four different views of its channels. The Netcaster bar shows a subset of some of the premium content channels. If you click any channel entry on this list, it expands to show

graphical information about the channel, and a button lets you add the channel. The channels you've added appear on the second view, My Channels. The final two views, accessible online only, include an expanded list of Netcaster channels, plus more than a hundred Castanet channels. Netscape has integrated the Castanet tuner—a client optimized for delivering applications—into Netcaster so it can receive Castanet channels seamlessly.

Netcaster's channel content appears in a "chromeless" instance of Navigator anchored to the desktop as if it were wallpaper. You don't see any borders, buttons, or toolbars in this view, called a Webtop.

Like Microsoft's Subscriptions, Netcaster can be used as an off-line browser. However, unlike Microsoft's integrated solution, Netscape uses a separate cache for the browser and Netcaster client.

Netcaster's greatest strength is also at the core of its greatest weakness. Because Netcaster relies on Java, JavaScript, and dynamic HTML, it is highly portable and can run on any platform Navigator runs on. However, some parts of the interface are not as polished or as easy to use as Microsoft's Subscribe wizard, for example. And Netcaster channels don't offer the same degree of configuration options.

For end user features, at this time, we give Microsoft the edge. But for multiplatform environments—especially enterprises that also plan to use Castanet—Netcaster is a solid push package.

home.netscape.com/comprod/products/communicator/index.html

ABCNews.com, AOL
Greenhouse, CBS SportsLine,
cInet, CNNfn, Excite,
Federal Express, go2net,
Hearst HomeArts,
Infoseek Industry Watch,
Kaplan Educational,
Knight-Ridder, Lycos,
Mapquest, Money.com's
Money Manager,
News Corp., N2K,
Quote.com,
The Gartner Group Advisor,
The Sporting News,
Travelocity, Wired Digital,
Wired Networks,
Yahoo!, ZDNet, and
more than 100 Marimba
Castanet channels.



* While supplies last and by returning your registration. IBM, Business Partner and Solutions for a small planet are trademarks of International Business Machines.

the
“our finance department
deals with all the paperwork.
Unfortunately the finance
department is also me”
solution

The IBM No More Paperwork Solutions.

Nobody sets up a business because they like doing paperwork. All too often being your own boss means long hours spent shuffling forms instead of chasing dreams.

IBM accounting solutions can automate tasks from accounts receivable and payable to inventory management. The result? A clear picture of your overall cash flow and improved cash management. And they run on the most popular operating systems out there. So you can get down to business, without disrupting business. We can also help

finance your acquisition with flexible and attractive leases.

Buy any IBM accounting solution and get a Dun & Bradstreet “Business Solution in a Box™” (a \$2,500 value, absolutely free).*

Call IBM at 1 888 IBM-5800 and we’ll send you a free “Guide to Doing Business on the Internet.” We’ll also put you in touch with an IBM Business Partner,™ an independent expert who can provide you with accounting solutions best suited to your business. For more information, visit us at www.businesscenter.ibm.com



Solutions for a small planet™

The Politics of Push

Together, Active Desktop and Netcaster will put push on tens of millions of desktop PCs. Naturally, this has not escaped the notice of established push vendors, most of which have already partnered with

Microsoft or Netscape. By integrating their existing push technologies with the two new browser solutions and focusing on core strengths, push vendors are hoping to ride the new wave rather than get crushed by it.

For PointCast, which has already hooked more than a million news junkies with its eye-catching delivery of news and information from respected publishers, Active Desktop is an opportunity to reach millions more. To receive PointCast, IE 4.0 users will simply subscribe to the PointCast channel. In addition, key pieces of PointCast (ActiveX controls and content) will come precached with Memphis.

PointCast was also among the first clients to support CDF. PointCast 2.0 (due by the end of summer) includes a new Connections channel that delivers CDF-based

content. This should broaden the types of content offerings available via PointCast.

Marimba has cast its net with Netscape. Castanet provides an alternative delivery mechanism for Netscape's corporate customers seeking a cross-platform solution for distributing software and bandwidth-intensive content. With its server software Castanet Transmitter (starting at \$995, direct), Castanet can scale up for large installations. The Castanet Tuner is tightly integrated with Netcaster; Marimba has adopted Netscape's Java VM and HTML rendering engine. Netscape's site lists more than a hundred Castanet partner channels.

PointCast and Marimba focus on pieces of the push pie. By contrast, BackWeb Technologies provides a complete solution for delivering everything from basic news

and information to large multimedia files, presentations, software upgrades, and drivers. BackWeb has formed a partnership with Microsoft, which is working to add support for BackWeb channels to the IE push client. Recently, BackWeb acquired Lanacom and its push client Headliner. The integrated BackWeb/Headliner client due this fall will support CDF files.

Like Castanet, BackWeb can serve as an alternative delivery mechanism that is scalable. BackWeb also provides much greater ability than CDF for targeting specific types of users. (Softbank, the parent company of *PC Magazine*, has investments in BackWeb and PointCast.)

Similarly, Wayfarer Communications is banking on its server-side technology, which includes tools for filtering content and delivering it in a secure manner. Wayfarer says its push product Incisa will support both CDF and Netcaster channels.

The rapid development of the push market is good news for both publishers and end users. It promises more compelling ways to present content and more channels to choose from.—John Morris □

Publishing with CDF and Netcaster

Although Microsoft and Netscape's push solutions represent a leap forward for end users, each is essentially a stopgap measure in the push standards' race. Microsoft has submitted its Channel Definition Format (CDF) to the W3C. Netscape has adopted a wait-and-see approach by using existing standards pending a decision by the W3C.

Underlying all push framework technology is *meta-information*, a method for describing site content and how it should be organized and delivered. Ultimately, the fight over push standards revolves around how meta-information should be handled. Both proposed standards are based on XML, a language similar to HTML that is a subset of SGML (www.w3.org/XML).

Microsoft's CDF is a new file type that conveys meta-information (www.microsoft.com/standards/cdf.htm). To make content available via a

Microsoft Webcasting channel, a publisher creates a CDF text file that indexes the site contents to be pushed and contains variables for recommended settings, such as how often to update the channel. CDF can be used to push desktop items and screen savers as well as ordinary pages. CDF's principal drawback is that it adds a new file type to your Web site.

Netscape takes a longer-term approach. Its current solution (Netcaster beta 2) sidesteps the meta-information question and uses existing standards (HTML, Java, and JavaScript) to push content in a more basic manner. To add a button or an icon to a Web page that installs a channel in the user's Netcaster client, you simply insert the JavaScript code into the page's HTML. The Netcaster architecture currently contains no meta-information.

From a developer's viewpoint, both CDF and JavaScript are relatively easy

to use. Moreover, Microsoft and Netscape both offer wizards that make it even easier to generate CDF files and Netcaster JavaScript, respectively.

But Netscape hasn't conceded the meta-information battle. It has proposed a solution to the W3C called the Meta Content File format (MCF), also based on XML and originally developed by Apple Computer Corp. (www.w3.org/Submission/1997/8). Theoretically, MCF doesn't require a separate file to be created in the way that CDF does. Rather, it is a set of APIs used to build a collaborative index of the Web similar to a database. This may be a more extensible approach, but whether it's any easier to implement than CDF is not clear.

Until the W3C issues a ruling, we won't have a standard description language or syntax for handling the content in push channels, and content providers will be stuck pursuing parallel design efforts.—JM

VISIO

Visualize your business™



It only takes a moment
with Visio to discover
a more productive
use of your time.

New version

5.0

You understand the power of communicating ideas graphically.

And the right tool makes complex ideas clear to everyone in your organization. The wrong tool leaves too much to interpretation. Because Visio® Standard 5.0 offers a complete toolbox with over 1,300 SmartShapes® symbols, you can be sure your ideas are expressed succinctly whether you use flowcharts, project timelines or any business diagram. And since Visio technology seamlessly integrates with the Microsoft Office

environment you already know, you'll be able to represent the information that describes your business in less time than you can say "org chart." Want to share the drawing with the rest of your team or branch offices around the world? Just email the Visio drawing or post it on your intranet site and everyone will be on the same page. To find out how you can dynamically communicate throughout your organization with Visio Standard 5.0 and other Visio products, call 1-800-24-VISIO ext. A021 or visit www.visio.com/standard.

© 1997 Visio Corporation. All rights reserved. Visio, the Visio logo, the Visualize your business logo, and SmartShapes are either trademarks or registered trademarks of Visio Corporation in the United States and/or other countries. All other trademarks, trade

names or company names referenced herein are used for identification only and are the property of their respective companies.

Flowcharts



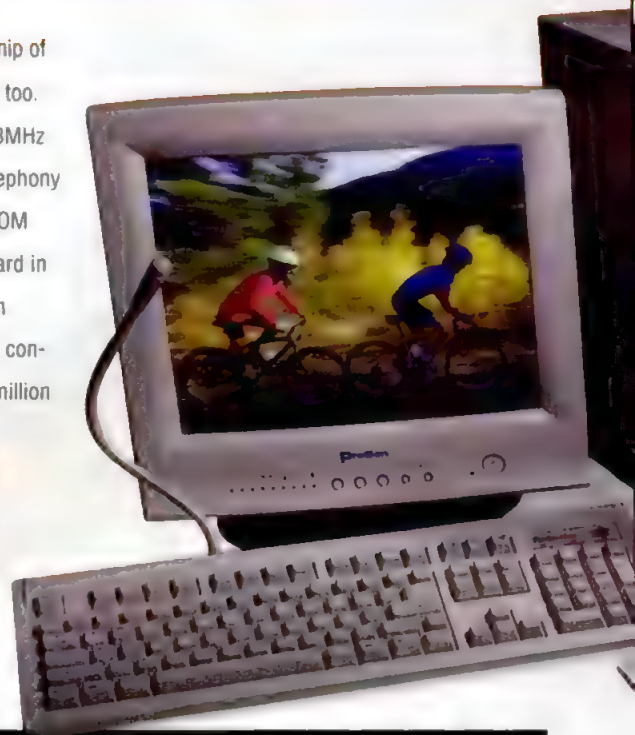


Put the ProGen Performance to Work for You.

We at ProGen Systems have built our success on what we call the partnership of performance and price. It's a way of doing business that works for us. And it works for you, too.

That's because we build-in the latest industry advances, including: ▶ Genuine Intel 233MHz Pentium® Processor with MMX™ Technology, the very latest from Intel ▶ 56K ready telephony modem for the fastest connection to the world wide web ▶ Lightning-quick 24X CD-ROM drives ▶ Two Universal Serial Bus (USB) Ports for easy hardware upgrades, now standard in most ProGen systems ▶ DVD (Digital Video Disk) drives for unsurpassed video, with an MPEG-II decoder ▶ Desktop cameras and video capture cards for state-of-the-art video conferencing ▶ 3D MPEG video graphic cards for resolution up to 1600 x 1200 with 16.7 million colors. And we offer all this to you at highly competitive prices.

Backed by the ProGen ProCare **3-year limited warranty, free tech support and on-site service**, our systems offer unsurpassed performance, reliability and value. Whether you're looking for a business professional, corporate or multimedia solution, ProGen has the system for you at a price that works for your budget. So call a ProGen consultant today, or visit our **on-line order** web site at www.progen.com, and put ProGen to work for you



Polaris Featuring Intel Pentium® II Processor

Common features: 512KB Integrated L2 Cache, **NEW 24X EIDE CD-ROM Drive**, 3D Stereo Wavetable Audio Subsystem, MS Mouse, Win95 KB, 1.44MB FDD, 2 Universal Serial Bus (USB) Ports, Super CD Bonus Pak: Home Office Suite 97, Infopedia Educational CD, Descent II, Havoc in 3D, Terminal Velocity, Microphone w/ Stand, ProGen ProCare Warranty: 3-Year Limited Parts + 1-Year On-Site

233MHz Pentium® II Processor

- ▶ 32MB EDO DRAM
- ▶ 4.3GB EIDE Hard Drive
- ▶ New 15" Digital PnP Monitor
- ▶ Diamond Stealth 3D 2MB VRAM Video Graphic Card
- ▶ **56K Ready Telephony Modem**
- ▶ Amplified Stereo Speakers
- ▶ MS Windows 95

\$1919

266MHz Pentium® II Processor

- ▶ 32MB EDO DRAM
- ▶ 5.1GB Fast EIDE Hard Drive
- ▶ ProGen 17" 28dp Digital PnP Monitor
- ▶ 33.6K Telephony Modem
- ▶ ProGen Gold 3D (S3 Virge) 4MB EDO DRAM, MPEG
- ▶ Subwoofer Sound System w/Amplified Stereo Speakers
- ▶ MS Windows NT Workstation v 4.0

\$2249

266MHz Pentium® II Processor

- ▶ 64MB EDO DRAM
- ▶ **NEW 6.4GB EIDE Hard Drive**
- ▶ ProGen 17" 28dp Digital PnP Monitor
- ▶ Diamond Stealth 3D 4MB VRAM Video Graphic Card
- ▶ **56K Ready Telephony Modem**
- ▶ Subwoofer Sound System w/Amplified Stereo Speakers
- ▶ MS Windows 95

\$2499

*Add a Desktop Camera, video capture, motion video, for \$199.

Edge

Discover 3D

Intel 200MHz Pentium® Processor with MMX™ Technology

- ▶ 512K Pipelined Burst Cache
- ▶ ProGen 15" .28dp Digital PnP Monitor
- ▶ ProGen GOLD 3D (S3 Virge) 4MB EDO DRAM, MPEG
- ▶ 16X EIDE CD-ROM Drive
- ▶ 33.6K Telephony Modem
- ▶ 3D Stereo Wavetable Audio Subsystem, complete with Amplified Stereo Speakers
- ▶ MS Windows 95/Hi-Res Mouse
- ▶ 1.44MB FDD/Win95 KB
- ▶ Home Office Suite 97, Infopedia Educational CD and 3 Exciting Games Pak, Microphone w/ Stand
- ▶ ProGen ProCare Warranty

166MHz Pentium® Processor w/MMX™ Technology
16MB EDO DRAM, 2.5GB Fast EIDE HDD

\$1049

200MHz Pentium® Processor w/MMX™ Technology
32MB EDO DRAM, 3.2GB Fast EIDE HDD

\$1219

233MHz Pentium® Processor w/MMX™ Technology
32MB EDO DRAM, 4.3GB Fast EIDE HDD

\$1399

Discover MPEG II

Intel 200MHz Pentium® Processor with MMX™ Technology

- ▶ 512K Pipelined Burst Cache
- ▶ 32MB EDO DRAM
- ▶ 5.1GB Fast EIDE Hard Drive
- ▶ ProGen 17" .28dp Digital PnP Monitor
- ▶ ProGen GOLD 3D (S3 Virge) 4MB EDO DRAM, MPEG
- ▶ NEW! DVD Drive with MPEG-II Decoder
- ▶ Desktop Camera, Video Capture, Motion Video
- ▶ Free MPEG-II Movie Title
- ▶ 3D Stereo Wavetable Audio Subsystem, complete with Sub-woofer & Amplified Stereo Speakers
- ▶ 56K Ready Telephony Modem
- ▶ MS Windows 95/MS Mouse
- ▶ 2 Universal Serial Bus (USB) Ports
- ▶ 1.44MB FDD/Win95 KB/Microphone
- ▶ Super CD Bonus Pak, Includes: Home Office Suite 97, Infopedia Educational CD, Descent II, Havoc in 3D, Terminal Velocity
- ▶ ProGen ProCare Warranty (3-Year Limited Parts + 1-year On-Site)
- * Upgrade to MS Natural KB, add \$30

200MHz Pentium® Processor w/MMX™ Technology

\$2129

166MHz Pentium® Processor w/MMX™ Technology

\$2029

233MHz Pentium® Processor w/MMX™ Technology

\$2269



ProGen ProCare Program is designed to provide you maximum protection. We offer comprehensive coverage with straightforward terms and conditions.

- ▶ ProGen 3-Year Limited Warranty with 1-Year On-Site Service
- ▶ 30-Day Money Back Guarantee (excluding shipping charges)
- ▶ Life-time Toll Free Technical Support
- ▶ 24-Hour Bulletin Board Service
- ▶ Optional Extended On-Site Service Programs Available
- ▶ Consumer and Commercial Leasing Programs Available



1-800-848-1353

Salon Hours: M-F, 9:30 A.M. - 7:00 P.M. PST • Sat., 9:00 A.M. - 3:00 P.M. PST
Technical Support: 1-800-777-5501 • **Customer Service:** 1-800-848-4767
Customer Service/Technical Support Hours: M-F, 9:00 A.M. - 5:00 P.M. PST

ProGen™ Technology Inc. 15501 Redhill Avenue, Tustin, CA 92780 Ph: 714/566-9200 Fax: 714/566-9267
BBS: 714/566-9255 E-Mail: webmaster@progen.com.

©1997 ProGen™ Technology Inc. Intel Inside logo and Pentium are registered trademarks and Pentium Pro, Pentium II and MMX are trademarks of Intel Corporation. All other trademarks are the property of their respective owners. Prices are subject to change without notice. * On site service is based on the discretion of ProGen technical support. Leasing Rate will vary depending on state legislation, and is intended for business or corporate use only. 30-day money-back Guarantee (shipping cost not included). Actual products may be different from products in photo.

CIRCLE 287 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

ProGen™

Works for You.

www.progen.com

ATI XPERT@Work

puts the future firmly
in your grasp.

ATI XPERT@Work is the NEW standard for Windows NT and Windows 95 graphics performance.

Professional Productivity

- Fastest performance for greater productivity in Windows NT and Windows 95
- Eliminate eye-strain with flicker-free images at up to 200Hz refresh rates
- Up to 8MB of ultra fast SGRAM for high resolution and true color acceleration

Leading Edge Support Now...

- Optimized for the best performance on Pentium II / PRO systems
- Rock-solid stability and worry-free compatibility with ATI's Microsoft Certified drivers

And for the Future

- With workstation-class 3D hardware that's DVD-ready, ATI protects your reinvestment into the future

Starting at \$179¹

Check out www.atitech.com or call (905) 882-2600



© Copyright 1997 ATI Technologies Inc. ATI XPERT@Work, 3D Rage Pro, ATI-TV and Now You See It are trademarks and/or registered trademarks of ATI Technologies Inc. All other product names are trademarks and/or registered trademarks of their respective owners. Features, performance and specifications may vary by operating environment and are subject to change without notice. Products may not be exactly as shown. ¹ATI driver used is a Microsoft Certification Candidate 2D WinBench 97 Business Graphics Test at 1024x768x16bpp, 75Hz, run on an Intel Pentium II 266MHz, 512K cache, 32MB SDRAM, PC bus, NT4.0. Hardware and software driver versions used: ATI XPERT@Work 4MB SGRAM driver release v4.10, Matrox Millennium 4MB VRAM v2.5 driver release v5.06, Diamond Multimedia Stealth 3D 3000 4MB VRAM v1.01 driver release v2.03. ²Suggested retail price for 2MB upgradeable version.

CIRCLE 059 ON READER SERVICE CARD
OR GO TO WWW.PCMAG.COM/ProductLink

Now You See It.



Recommendation Systems

Advice

From the Web

Make more informed choices using the opinions of your fellow Web users and cool technology as your guides.

By Richard V. Dragan

The advent of the Internet brought dramatic changes in the way we get information and interact with others. Now we may be seeing a new era emerge, in which advances in personalization make the Internet even more indispensable. Web sites already use many tactics to provide some measure of personalization, from asking for demographic information to implementing recommendation systems, a promising new technology that predicts your likes and dislikes based on the tastes of others.

You can trace the roots of recommendation systems to several independent groups of researchers who, with the rise of the Web, parlayed their work into commercial ventures, forming Firefly Network, LikeMinds, Net Perceptions, and WiseWire Corp. Firefly, Net Perceptions, and WiseWire grew out of research begun at universities—MIT, the University of Minnesota, and Carnegie Mellon, respectively. LikeMinds' technology was not developed in academia, but the company succeeded in obtaining the only U.S. patent so far for *collaborative filtering* technology, a key component of *recommendation sys-*



IN THIS REVIEW

Firefly Passport Office	135	WiseWire.com	142
GroupLens Recommendation Engine	136	The Basics	134
LikeMinds Preference Server	141	Making It Personal	134
		Summary of Features	144

The Basics

NOT WITHOUT A PRICE

In order for a recommendation system to work for you, you must tell Web sites using this technology who you are and give up demographic information. These systems track your presence through a site—in the case of Firefly, across multiple sites.

HONESTY IS THE BEST POLICY

As tempting as it may be to lie in order to avoid giving personal information to marketers, doing so only decreases the quality of your results. You should also be truthful when rating items. Any recommendations you receive will be more accurate if you are truthful about what you do and do not like.

RATINGS SYSTEMS

Firefly uses a 1-through-7 system, ranging from "hate it" (1) to "the best" (7). Net Perceptions uses an F-through-A scale to rate movies on the Moviefinder site. LikeMinds allows for more specific ratings on its two movie sites, Movie Critic and Movie Matchmaker. You can give a movie 1 through 13 stars, refuse to rate it, or state that you can't remember it. WiseWire.com lets you rate the individual items in a subject category, or Wire, on a 1-through-10 scale; you can also tell the system whether an article belongs in a particular Wire and rate the author or source.

DELAYED GRATIFICATION

WiseWire makes recommendations immediately and continually updates them. Firefly offers recommendations after you've made as few as 6 to 12 ratings. In its two implementations, LikeMinds requires you to rate 12 movies before making recommendations. Net Perceptions asks you to rate dozens of movies before it returns any results on the Moviefinder site.

tems and often used synonymously. These four companies' products perform the same function—making suggestions based on user preferences—but each has a particular focus and certain key features.

HOW IT WORKS

Collaborative filtering uses algorithms that factor in the preferences of a community of users to predict what a given user will like or dislike. The way it works for you is simple: A Web site keeps a database of people's preferences on some item of interest—books, for example. When you come to the site looking for a book, you are asked to rate several books, and your ratings are matched to those of other users. If a set of people like the same ten books you did, and they also liked two others, the assumption is that you'll like those other two titles as well. Thus, the site can recommend books to

you—often with surprising accuracy. Recommendation systems work, and they work whether you're rating books, movies, or products in a catalog.

A recommendation system should increase in accuracy over time, as more users enter preferences on more items. Databases can be shared across interest groups, as with Firefly Network's Community Navigator, providing even more data on which to base intelligent recommendations.

Computationally, collaborative filtering is fast and efficient, especially when compared with traditional

artificial-intelligence approaches to solving problems, such as neural networks and rules-based processing. Collaborative filtering takes some of the things that human beings do best—thinking and making critical judgments—and applies that knowledge for new users. The heavy-duty "processing" here is done by people, not

www.pcmag.com

Explore our **animated infographics** for a better understanding of these recommendation systems.

SUMMARY OF FEATURES

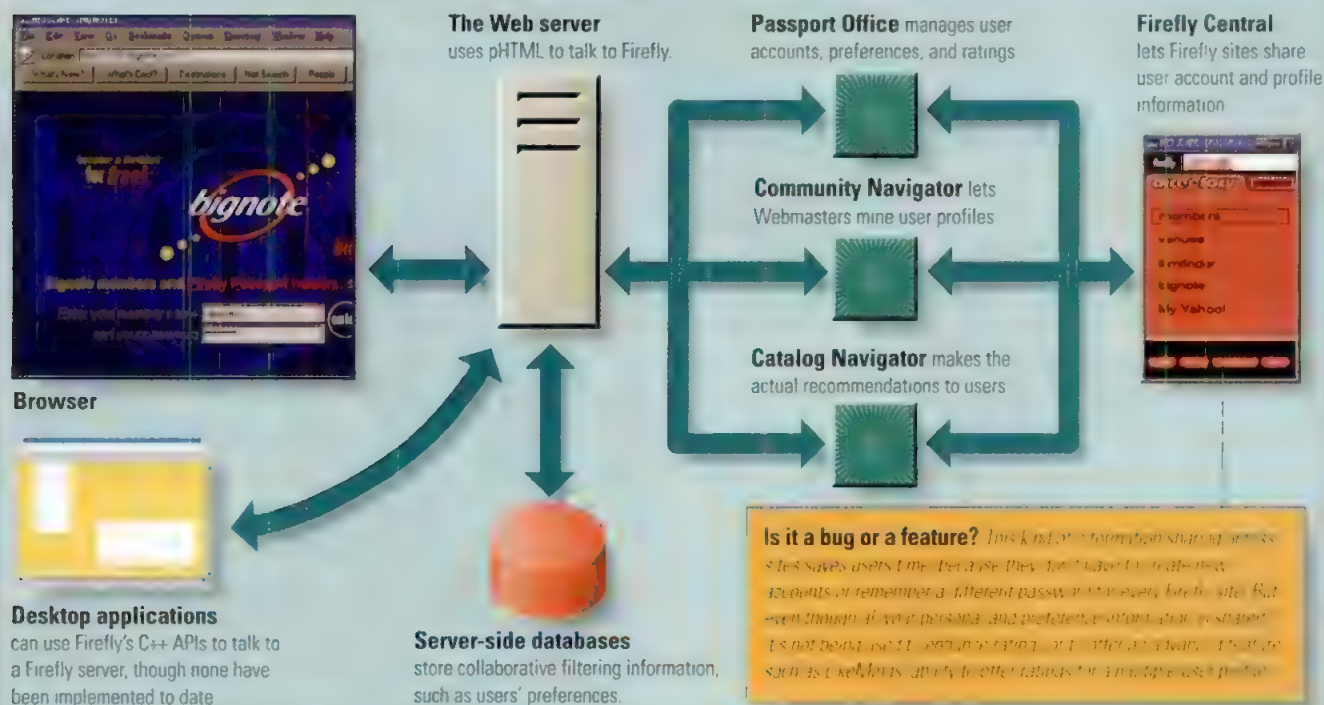
Recommendation Systems

■ YES NO

Vendors listed in alphabetical order

	Firefly Network Inc.	LikeMinds Inc.	Net Perceptions Inc.	WiseWire Corp.
URL	www.firefly.net	www.likeninds.com	www.netperceptions.com	www.wisewire-corp.com
Product	Firefly Catalog Navigator, Community Navigator, Passport Office	Preference Server	GroupLens Recommendation Engine 2.0	WiseWire.com 2.0
Licensing fees	\$25,000 and up	\$25,000 and up	\$25,000 and up	Customized
Sample Web sites	my.yahoo.com , www.barnesandnoble.com , www.bignote.com , www.filmfinder.com , www.firefly.com	www.cinemax.com , www.moviecritic.com	www.amazon.com , www.moviefinder.com , www.sierra.com	www.wisewire.com
Supports explicit/implicit ratings	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Privacy: Shared user profiles	■	■	■	■
Operating-System Support				
Windows NT	■	■	■	■
SPARC	■	■	■	■
Irix	■	■	■	■
Web Server Support				
Microsoft IIS	■	■	■	■
Netscape Enterprise and FastTrack	■	■	■	■
Other	None	Apache	None	None
Database Support				
Oracle 7	■	■	■	■
Informix	■	■	■	■
Microsoft SQL Server	■	■	■	■
ODBC	■	■	■	■
Proprietary database	■	■	■	■
Developer Support				
Server side:				
C++/CGI/Java	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Castanet	■	■	■	■
Client side:				
C++/HTML/Java	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■

Behind the Scenes: Firefly Network



machines. The math behind collaborative filtering is remarkably simple and can be handled in real time. That's a good thing, because personalization should not interfere with the rest of a Web site.

THE KILLER APPS

You don't need an MBA to see recommendation systems as a good fit for Web commerce—matching buyers with products and targeting ads, for example. Heavy-duty electronic commerce will use collaborative filtering, but the potential of other applications is just as promising.

Every site with a recommendation system today works explicitly, requiring you to rate items before receiving results. The technology, however, can also be used implicitly. Net Perceptions' product can track such behavior as placing an item in a shopping basket but not purchasing it. Recommendation systems can also help build community by putting you in touch with people who like what you like. Firefly, My Yahoo! (which uses Fire-

fly's technology), and, to a lesser degree, WiseWire.com implement this feature. (For more on community building on the Web, see "Talk of the Net" in this issue.)

As important as community and commerce are, the Web's primary function is as a repository of information, and recommendation systems can enhance this aspect as well. WiseWire delivers personalized news and information, and Net Perceptions can use Marimba's Castanet technology to push recommendations to your desktop.

THE CONCERNS

Personalization is great, but to attain it you must surrender some privacy. You may be willing to exchange information for the ability to make better-informed purchases, but you may not want other marketers to see that information. To facilitate the secure, private exchange of user profile information among personalized Web sites, Firefly Network, along with Netscape and VeriSign, has submitted the Open Profiling Standard (OPS) to

the World Wide Web Consortium. This specification would allow personal profiles to be exchanged safely but would also facilitate the wider adoption of personalized Web content. (For more information on OPS, see "Protection at the Desktop" in this issue.)

Whatever your interest, a personal Web is clearly a better Web. If you're managing a large site, consider how a recommendation system might enrich your customers' experience. If you're a Web surfer, take advantage of one of the sites employing this exciting and useful technology, and become your own best critic.

Firefly Network Inc.

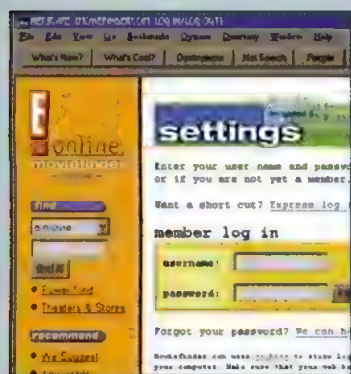
Firefly Passport Office

ALL REVIEWS BY RICHARD V. DRAGAN
With several popular Web sites and high-profile deals with Reuters and Yahoo! to its credit—as well as the added bonus of having been the first on the market—Firefly Network is responsible for introducing millions of users to recommendation systems. Firefly's approach emphasizes community, linking you to users with similar interests across a network of sites.

At Firefly's showcase site (www.firefly.com) you register for an account, or

Our Contributors: RICHARD V. DRAGAN is a programmer at PC Magazine Labs. DAVID LIDSKY was the associate editor in charge of this story, and JAY MUNRO was the project leader.

Behind the Scenes: Net Perceptions



Browser

The Web server uses the GroupLens C++ API to access the components that provide collaborative filtering intelligence.

Prediction Process manages predictions about recommended items.

Data Manager handles the interaction between the GroupLens package and the database.

Databases contain product info, customer info, correlations, and ratings.

Rating Broker handles user accounts and ratings information.

Rating Process handles user ratings using both explicit and implicit feedback.

Like WiseWire, GroupLens offers an inventive but less intrusive twist on recommendation systems. In addition to explicitly rating items, users can implicitly influence the level of personalization they receive simply through their behavior on the site. GroupLens can observe and record such information as the amount of time you dwell on a particular page. Implicit rating means that you can get better recommendations without doing lots of overt rating.

Firefly Passport, which acts as a sort of navigational command center for the various Firefly features and sites. The Passport provides links to Filmfinder (www.filmfinder.com) and BigNote (www.bignote.com), and access to user-created chat rooms and bulletin boards. You can search for specific users or for users with similar tastes, send instant messages, and quickly create a small personal page.

Firefly uses a 1-through-7 rating system for recommendations, similar to the F-through-A grades at Moviefinder. You must rate at least six items before receiving any recommendations. The more input you give, of course, the better the returns.

Other companies have licensed Firefly tools and technology for use on their own sites. Yahoo!, for example, supplements My Yahoo! (my.yahoo.com), its personalized search site, and by the time you read this, Barnes & Noble's online bookstore (www.barnesandnoble.com) should be using Firefly technology to make personalized book recommendations.

UNDER THE HOOD

Firefly's recommendation system is made up of several parts: the actual technology, called Advanced Collaborative Filtering (ACF), and various tools that help Webmasters implement ACF. To build Firefly's technology into their sites, Webmasters use either HTML extensions or Firefly's object-oriented C++ APIs.

The Catalog Navigator tool is the main delivery mechanism for recommendations. Together with the Community Navigator tool, it houses Firefly's collaborative filter. Webmasters can mine user profiles for demographic information using Community Navigator, which matches a user's data with that of others on the site.

The Passport Office tool can simplify user account and profile management by automatically passing account information between sites. That means users can log on to other sites that use Firefly's collaborative filtering without creating new accounts. To address concerns about this kind of information sharing as well as security in general, Firefly provides password protection and user-information en-

ryption. It also contracts with Coopers and Lybrand to evaluate its privacy procedures and participates in TRUSTe, a watchdog organization for Internet security issues.

Firefly's slick sites, well-packaged tools, and head start in the public eye make it the player to beat as recommendation systems gain popularity with users. **Firefly Passport Office.** Firefly Network Inc., Cambridge, MA; 800-404-4724; www.firefly.com. Circle 441 on reader service card.

Net Perceptions Inc.

GroupLens Recommendation Engine

Expanding the ways that recommendation systems can be used creates a greater opportunity for them to gain widespread appeal. With its GroupLens Recommendation Engine, Net Perceptions has developed a number of clever twists on the theme, such as push-technology support via a Castanet plug-in, something no other company has introduced. GroupLens also lets Web sites ascertain your preferences *implicitly*—that is, based on actions you make on the site. These innovations make it the most



It's a No Brainer.



- A. It's as fast as they come, and then some.
- B. It's technologically, the state-of-the-state-of-the-art.
- C. Its components are made by the best of the best.
- D. It's got 7-day, 24-hour technical support from live human beings.
- E. It's been commended and recommended by all the trade books.
- F. It has a loyal following that swear by it - not at it.
- G. And, here's the kicker. It actually costs less!

Now Why Would You
Consider Anything Else?



Choosing the right PC is as easy

A.

Top-Rated Performance

Quantex systems aren't just built to perform, they're built to out-perform. We're always raising the bar on standards a notch or two. We engineer our systems to the Nth degree and put everything through the toughest quality control tests. Just some of the reasons why Quantex PCs always put on a great performance.

PC Computing, 4/97
Quantex QP5/200 SM-3



Verdict: The best-priced MMX™ technology machine you'll find—and it's loaded with extras.

Source: PC Computing Benchmarks



B.

Cutting-Edge Technology

If it's the newest, the fastest, or the most innovative development, you can bet Quantex will be one

- ☒ **Pentium® II Processor**
- ☒ **K56 Flex Modem**
- ☒ **DVD**

of the first to have it. We pride ourselves on being a leader, not a follower. Being among the first to incorporate the Pentium® II processor, K56flex modems and DVD into our systems are just a few examples of this forward thinking.

C.

Brand-Name Components

Look inside any Quantex PC and you'll see lots of names you recognize. That's because we only use components made by the undisputed leaders in the PC industry. The best of the best! Why are we so fussy? Simple. At Quantex, we know a PC is only as good as the sum of its parts.

Computer Shopper, 8/97

"The Quantex QP6/266 SM-4x offers high-quality components and field-leading performance at an alluring price."

D.

Living, Breathing 24-hour support

We provide expert technical support 24 hours a day, 7-days a week. Talk to real-live people who will solve your problem - not a frustrating know-nothing recording. On top of that, over 95% of incoming calls are answered in less than three minutes.

We rate with the best.

In a recent Windows Magazine Tech Support Survey, Quantex received a report card that put us right up there at the head of the class. And we're talking about the biggest names in the PC industry.

OVERALL RANKINGS FOR DESKTOP VENDORS

PC VENDOR	GRADE
Dell, Hewlett-Packard, IBM, Quantex	Excellent
Compaq, Gateway 2000, Micron, NEC	Good
Acer, AST, Toshiba	Fair
AT&T, Digital, Packard Bell	Poor

Windows Magazine, 8/97

as A, B, C, D, E, F, G.

F.

Loyal Following

If you really want to know how good a Quantex PC is, check out the number of buyers who come back to buy from us a second time. And a third time. No one has a more loyal following than Quantex. For the past decade, we've sold hundreds of thousands of PC's into homes and businesses and the vast majority of customers have expressed their total satisfaction in the best way possible. By coming back for more.

E.

Highly Acclaimed

Read any good PC trade magazines lately? Well, if you have, you can't



help but notice the way Quantex keeps getting great reviews on its systems and lots of "thumbs up" from the trade press. Quantex has received over 10 PC World Best Buy awards and has been on PC World's Top 20 list over 61 times in the past 12 months. But don't think we're sitting on our laurels. These awards only spur us on to earn even more!

WOULD YOU BUY AGAIN?

VENDOR	% WHO WOULD BUY THE SAME BRAND
Dell	92%
Quantex	91%
Hewlett-Packard	89%
IBM	89%
Micron	81%
Gateway	80%
Acer	74%
AST	74%
NEC	71%
AT&T	69%
Digital	69%
Toshiba	61%
Compaq	58%
Packard Bell	51%

Windows Magazine, 8/97

G.

And Here's the Kicker. It Costs Less!

Quantex is, hands down, the undisputed leader in offering the most for the least.

See for yourself.....

QP6/266 SM-4x

(featuring the Pentium® II Processor)

\$2899

Business lease: \$101/Mo.

- 266MHz Pentium® II Processor
- 2 Universal Serial Bus (USB) Ports
- 64MB EDO Memory / 512KB Secondary Cache
- 6.4GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Matrox Millennium II 3D w/8MB VRAM
- 17" Digital Monitor (16.1" viewable)
- K56flex™ protocol Fax/Modem w/Voice Mail and Speakerphone
- 24X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit WaveTable Sound Card
- Altec Lansing ACS-45 Speakers w/subwoofer
- ATX Case
- 104-Key Keyboard With MS IntelliMouse
- MS Windows '95 With MS Plus
- MS Office 97 Small Business Edition
- 3-year limited warranty, 24-hr./7-day Technical Support

QP6/233 SM-4x (featuring Pentium® II processor).....\$2799

QP5/233 SM-4 (with MMX™ Technology).....\$2549

QP5/200 SM-4 (with MMX™ Technology).....\$2449

QP6/233 SM-3x

(featuring the Pentium® II Processor)

\$2499

Business lease: \$87/Mo.

- 233MHz Pentium® II Processor
- 2 Universal Serial Bus (USB) Ports
- 32MB EDO Memory / 512KB Secondary Cache
- 6.4GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Matrox Millennium II 3D w/4MB VRAM
- 17" Digital Monitor (16.1" viewable)
- K56flex™ protocol Fax/Modem w/Voice Mail and Speakerphone
- 24X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit WaveTable Sound Card
- Altec Lansing ACS-45 Speakers w/subwoofer
- ATX Case
- 104-Key Keyboard With MS IntelliMouse
- MS Windows '95 With MS Plus
- MS Office 97 Small Business Edition
- 3-year limited warranty, 24-hr./7-day Technical Support

QP6/266 SM-3x (featuring Pentium II Processor).....\$2699

QP5/233 SM-3 (with MMX™ Technology).....\$2299

QP5/200 SM-3 (with MMX™ Technology).....\$2199

QP6/266 WS-3x

(featuring the Pentium® II Processor)

\$2549

Business lease: \$89/Mo.

- 266MHz Pentium® II Processor
- 32MB EDO Memory / 512KB Secondary Cache
- 4GB EIDE Mode 4 HD / 3.5" 1.44MB Floppy Drive
- Matrox Millennium II 3D w/4MB VRAM
- 17" Digital Monitor (16.1" viewable)
- 3COM 3c905 PCI 10/100 NIC
- 24X Max EIDE CD-ROM Drive
- ATX Case
- 104-Key Keyboard With MS PS/2 Mouse
- MS Windows NT 4.0 Workstation
- 3-year limited Warranty, 24-hr. / 7-day Technical Support

QP6/233 WS-3x (featuring Pentium II Processor).....\$2399

QP5/233 WS-3 (with MMX™ Technology).....\$2099

QP5/200 WS-3 (with MMX™ Technology).....\$1999

Call your sales consultant for current DVD upgrade pricing



GOOD CHOICE.™

1.800.346.6572

www.quantex.com

trademarks of Microsoft Corporation. K56flex is a trademark of Lucent Technologies and Rockwell Int'l. All other company trademarks are trademarks of each respective company.



Canada
1-800-793-4167



Puerto Rico
1-800-793-4185

CIRCLE 074 ON READER SERVICE CARD

LONGREACH, AUSTRALIA —

CHRISTENE CAPEL HAS A COMPUTER.

A MODEM. AND A QUEST FOR KNOWLEDGE.

FROM A 70,000 ACRE SHEEP RANCH
IN THE AUSTRALIAN OUTBACK,

SHE ATTENDS QUEENSLAND UNIVERSITY OF TECHNOLOGY
1,500 KILOMETERS AWAY.

ELECTRONICALLY.

"I NEVER
HAD ANY INTEREST
IN COMPUTERS,"
SHE SAID,

"UNTIL I DISCOVERED
WHERE THEY CAN
TAKE YOU."

As she nears her masters degree in education, Christene Capel is discovering, as many have, that computers and the Internet don't make the world smaller. They open it up and expand it.

Because no matter where you are in the world, the rest of it is available to you through computers and the Internet. And no matter where you are in the world, you'll find Seagate technology inside the computers and communications servers that bring you the rest of the world.

You see, we're the world leader in technology for data storage and archiving. And much of the data on the Internet is stored on Seagate disc drives. Backed up by our tape drives. And downloaded to our disc drives in PCs in places like Longreach. Or where you are.

One World. One Drive.

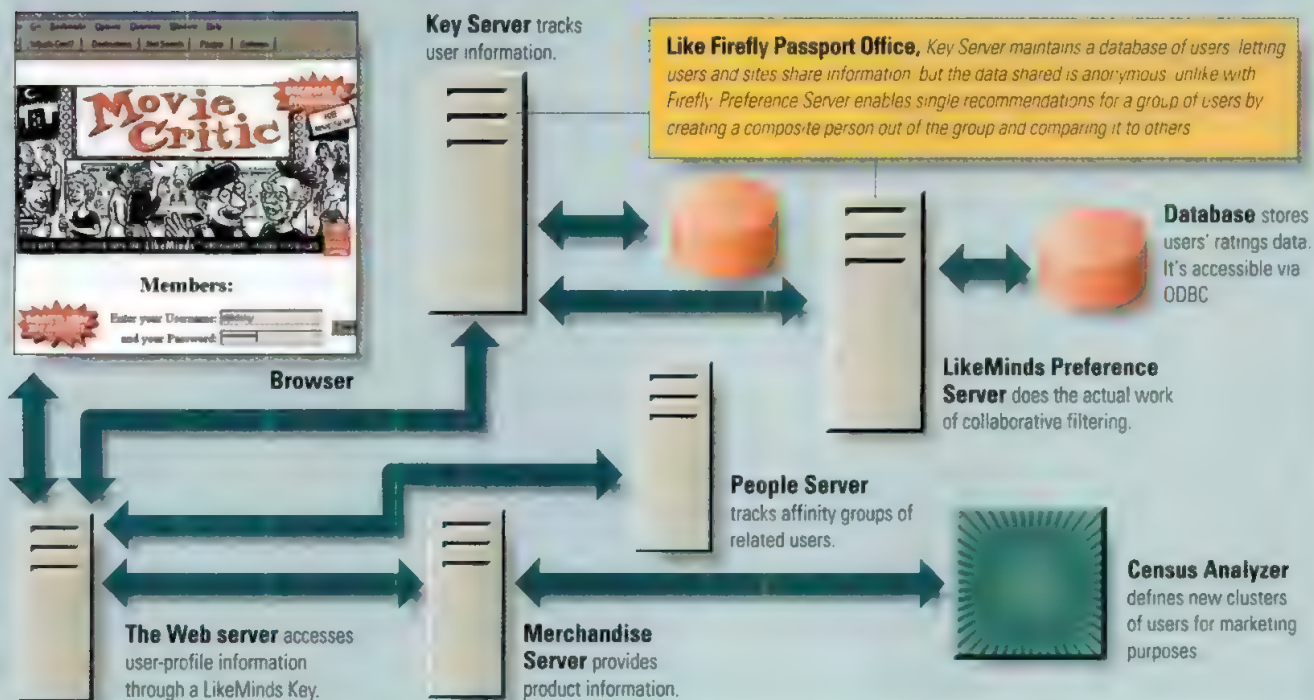
Seagate. Technology for an expanding world. To learn more about Seagate and its products, see us at www.seagate.com or call 408-438-8111.

 **Seagate**

CIRCLE 271 ON READER SERVICE CARD
OR GO TO WWW.PCMAG.COM/ProductLink

For information on Seagate Tape Products, call 1-800-441-4444. To learn more about Seagate's products, visit our website at www.seagate.com.
©2000 Seagate Technology, Inc. All rights reserved. Seagate, the Seagate logo, and One World. One Drive. are registered trademarks of Seagate Technology, Inc. in the U.S. and other countries.

Behind the Scenes: LikeMinds



promising product in the roundup.

The only GroupLens-powered site operating publicly at this writing is the Moviefinder subsite (www.moviefinder.com) of the Web site E! Online (www.eonline.com). Other companies planning to implement Net Perceptions technology on their sites are online bookstore Amazon.com (www.amazon.com) and gaming giant Sierra Online (www.sierra.com).

E! Online does a good job of integrating GroupLens into Moviefinder. In addition to rating a movie, you can learn about its director and cast. You can also see how Moviefinder predicts you'll rate a movie and compare that with the cumulative rating of all users. We had to rate quite a few more movies than with competitors Filmfinder (Firefly) and Movie Critic (LikeMinds) before getting feedback.

What makes GroupLens stand out from most of the products in this roundup is that it lets sites incorporate a variety of feedback from users. Users can rate *explicitly* by giving thumbs-up/thumbs-down (or in-between) ratings to items. GroupLens then takes ratings a step further by recognizing

implicit feedback. While shopping online, for example, placing an item in your shopping basket—even if there's no final sale—contributes to a positive rating. This way, you can always be refining and improving the recommendations you receive without having to be constantly rating items. Currently, Moviefinder does not make use of this more subtle ratings capability.

For Webmasters, GroupLens has some appealing and distinctive features. You can program in C or Perl; in either, you will have to contend with only a few APIs and functions. The latest version of GroupLens, Version 2.0, includes support for ODBC databases, more accurate filtering, and multiple recommendation algorithms.

Net Perceptions offers a plug-in for Marimba's Castanet so that pushed content can benefit from collaborative filtering smarts. In theory, the combination of a recommendation system and push means you'd get more content that you like delivered automatically to your desktop.

With its powerful technology, push compatibility, and simplified API, GroupLens has some hot technology. How it

fares, however, will depend on how Webmasters implement all the features GroupLens has to offer.

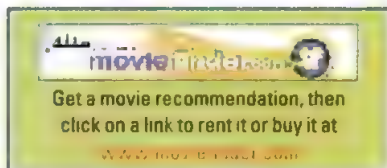
GroupLens Recommendation Engine 2.0. Net Perceptions Inc., Minneapolis; 800-466-0711; www.netperceptions.com. Circle 442 on reader service card.

LikeMinds Inc.

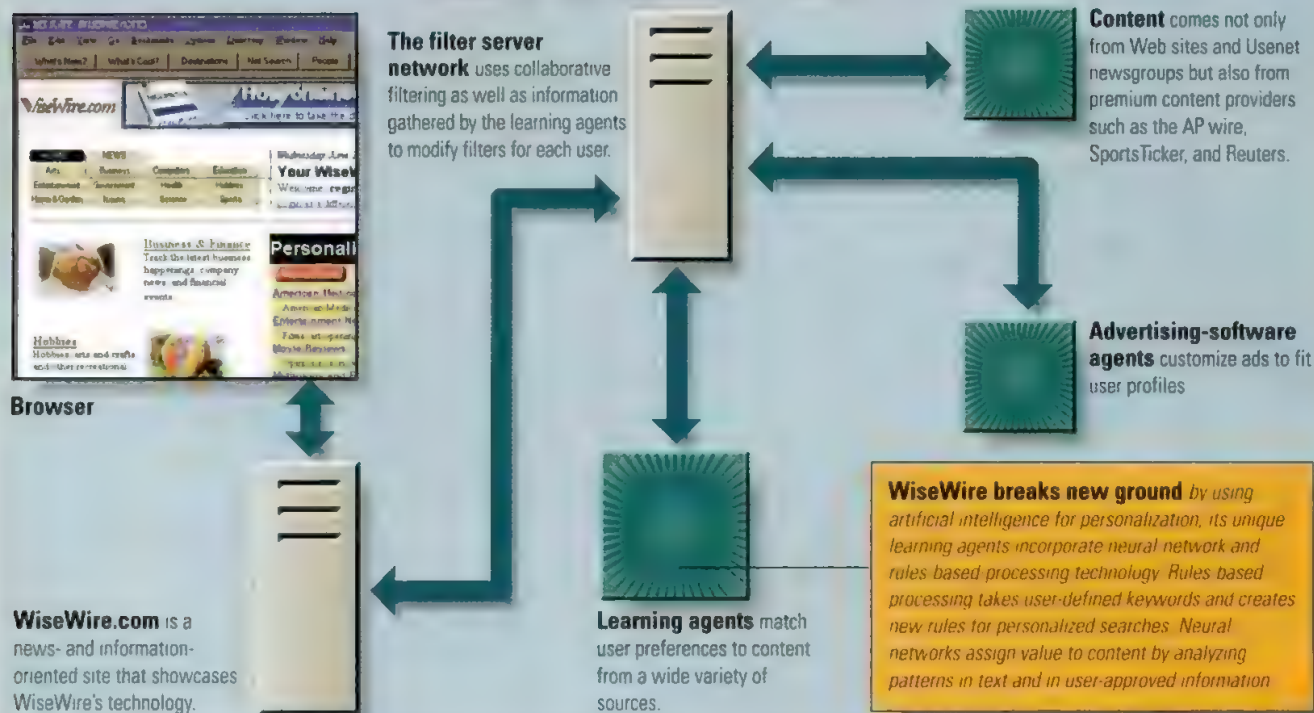
LikeMinds Preference Server

With its recommendation system, LikeMinds takes a few unique approaches, such as offering the ability to return a single set of recommendations from multiple users' ratings, and the creative parsing of databases to tailor returns more accurately. Although these features are currently available only on movie sites, we look forward to their implementation in other settings.

At Movie Critic (www.moviecritic.com), a site that shows off LikeMinds technology, users rate their favorite movies on a more detailed scale than at Moviefinder (GroupLens) or Filmfinder (Firefly). You can rate as few as 12 movies before Movie Critic returns results; Moviefinder requires you to rate dozens. Movie Critic can also make recommendations for two users so that you and a friend



Behind the Scenes: WiseWire



can find a movie that you both might like.

Another movie and video site also employs the LikeMinds technology. Movie Matchmaker, from Cinemax/HBO (www.cinemax.com), helps users select a movie to watch at home or at the theater. This site is similar in spirit to Movie Critic but can specifically recommend movies on Cinemax, in the theater, or on video.

As the first company in this roundup with U.S. patents on its technology, LikeMinds can claim to have pioneered collaborative filtering. Besides basic filtering and consideration of user preferences, LikeMinds offers several standout features. Its filtering engine delivers confidence-level ratings for each user, so you'll know how sure the engine is about the picks you're getting. In case you prefer a process-of-elimination approach, the "worst bets" feature in LikeMinds lets this technology return items that you're least likely to enjoy.

FOR THE WEBMASTER

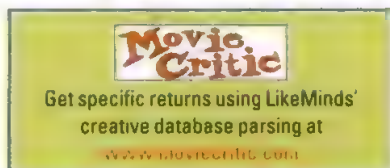
LikeMinds' collaborative filtering technology is powered by LikeMinds Preference Server, a package that offers Webmasters

a variety of options for implementing a recommendation system on their sites. The product relies on CGI scripts and C++ libraries, and it works with any ODBC-enabled database. Webmasters can also use sample HTML templates to help get a filtering-based site up and running quickly.

For getting control of a recommendation-enabled Web site, LikeMinds Preference Server lets Webmasters handle filtering data by genre easily. What users like about books will not necessarily work for their preferences in movies, for example. This approach differs from Firefly's, which encourages cross-site data sharing. You can define new genres as needed and group users' ratings accordingly.

Though its success to date has been centered on movie- and TV-related sites, LikeMinds' technology should be able to deliver intelligent filtering for a wide variety of Web sites. From what we've seen so far, this is an able contender.

LikeMinds Preference Server. LikeMinds Inc., Sebastopol, CA; 707-829-6500; www.likeminds.com. Circle 443 on reader service card.



WiseWire Corp.

WiseWire.com

With a decidedly content-oriented focus, WiseWire Corp. delivers personalized news and information from a wide variety of sources. This unique technology initially feels like a search engine or an agent-based product, because it returns results after you select a topic of interest. But it uses collaborative filtering to take data retrieval to the next level by learning from users which sources are best for particular topics. This approach makes WiseWire ideal when you're performing a continuing research project.

The best demonstration of WiseWire technology at work is the company's own Web site (www.wisewire.com). This site organizes content into specific sources called Wires. You can subscribe to Wires on hundreds of topics from the world of news, hobbies, sports, and entertainment. Content is delivered from a wide range of sources but filtered according to your tastes. There's premium content from Reuters, The Associated Press, PR Newswire, BusinessWire, and SportsTicker. Other content is assembled from Web pages, other news and entertainment

It makes **COLOR** work for you ...in more ways than one

ONE FOR ALL...ALL FROM ONE!

If you're ready to add a real edge to the way you do business, you're ready for the MFC-7000 Color Multi-Function Center™. That's because it's designed to take full advantage of the most important weapon in your professional arsenal...color. From its high resolution color printer, color copier and color scanner to its unique ability to send color faxes, our MFC-7000 gives your image all the color edge it needs—right at your fingertips. Speaking of image, its exclusive built-in video-capture function lets you capture images from a VCR, camcorder or digital camera. Combine that with a full feature plain paper fax and a digital message center, and you can see why the MFC-7000 will work for you... in color...and in more ways than one.

For around
...\$999†

COLOR PRINTER

Up to 720 x 720 dpi
Up to 5 ppm mono/
3 ppm color print speed
200 sheet paper
EcoMode™

COLOR COPIER

Vibrant color copies
(No PC required)
Up to 99 Multiple copies
Reduce and enlarge
from 50% to 200%

COLOR SCANNER

Visioneer Paperport®
Up to 1200 x 1200 dpi*
Xerox™ TextBridge® OCR
256 gray scale/
24 bit color

COLOR PC FAX

Send and receive
color faxes between
other MFC-7000 users
(via PC)
Send color faxes to
anyone that has PC
with fax modem.**

PLAIN PAPER FAX

30 page auto
document feeder
14.4k bps fax modem
2MB memory
(up to 100 pages)
80 station auto
dialing

MESSAGE CENTER

50 minute digital
answering system
Store both your voice
and fax messages
Remote fax retrieval

AVAILABLE AT:
Office Depot • Staples
OfficeMax • CompUSA
and other fine retailers

VIDEO CAPTURE

Capture video frames
from your VCR, camcorder,
or digital camera

Direct copy capture or into PC
Standard NTSC
video jack

color scan color copy color print fax it messages video capture

* Interpolated resolution (300 x 300 dpi optical)
** For non-MFC-7000 users a compatible
"read program" is included

FREE CD SOFTWARE

OVER
\$300
SOFTWARE
VALUE

- Visioneer Paperport®
- Xerox™ TextBridge® OCR
- MetaTools Kai's Power Goo™
- Corel Print and PhotoHouse™
- My Professional Marketing Materials™



brother®

We're at your side.

Brother International Corporation, Somerset, NJ ■ Brother Industries, Ltd., Nagoya, Japan
FOR MORE INFORMATION PLEASE CALL THE BROTHER FAX-BACK SYSTEM 1-800-521-2846 OR VISIT OUR WEB SITE AT <http://www.brother.com>

All trademarks and registered trademarks referenced herein are the property of their respective companies. †Actual price may vary. © 1997

CIRCLE 208 ON READER SERVICE CARD

Making It Personal

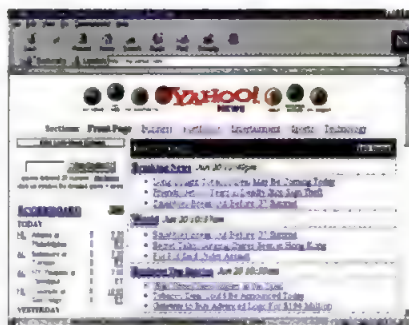
Personalizing content is Priority One for many of today's Webmasters. Recommendation systems are one way to personalize Web content, but they aren't the only way to go. Below, we look at several ways to help users feel at home on your site.

The simplest kind of personalization on the Web is the *forms-based questionnaire*. A range of Web sites use this method to create customized pages, including My Yahoo! (my.yahoo.com) and The Microsoft Network (www.msn.com). After you define your interests, the site stores them for your next visit. Whenever an item of interest appears—say, an article or a review—it appears on your custom Web page.

Rules-based processing goes a step beyond questionnaires. With a rules-based engine, a site can scan content for items that meet certain predefined conditions and then return those items to the user. Rules-based processing, which lies at the heart of many search engines, can lead to fairly personal content. (See the News Tracker feature on www.excite.com for a good example.) Rules-based sites can be *adaptive*, in that they can refine their rules based on user responses. Change your keywords and content will change too.

sources, and 20,000 Usenet newsgroups. Like Firefly, WiseWire.com tries to create a sense of community for users. For each general subject category, you can access relevant newsgroups and chat rooms created in conjunction with Talk City.

If you're concerned about feeling overwhelmed, don't worry. The WiseWire engine uses recommendations and machine learning to limit the content to what you're likely to find interesting. As with LikeMinds and many search engines, the relevance rating of each article is displayed. When you browse and read items in WiseWire, you're asked to rate the relevance of each article. The recommendation-system en-



My Yahoo!'s personal home page is a simple, forms-based way to customize the Web.

Perhaps the most powerful application of artificial-intelligence research is the *neural network*. For years, programs such as image and speech recognition software have used neural-network technology with great success to recognize patterns. Traditionally, neural networks have been too processor-intensive to be practical. But algorithms have improved and hardware has progressed far enough to allow real-time neural networks on the server. For example, one of the vendors in this roundup, WiseWire Corp. (www.wisewire.com), supplements its recommendation algorithms with neural-network technology.

The chief advantage of using neural

gine will then use your preferences to fine-tune what it gives you the next time around. Within this give-and-take of content and feedback, WiseWire.com can grow fairly precise in gauging your tastes.

WiseWire's approach to scanning and



rating content is unique among the products considered here. As with many of today's search engines, all content is scanned for matches with a user's interests. WiseWire combines the community-based algorithms of recommendation systems with more traditional artificial-intelligence techniques. This will likely involve more of a training phase, but the result is a more content-aware approach to filtering

networks for personalization is that the neural network-based engine does the rating for you; there are no forms to fill out and nothing to rate. As you are reading an article on a Web page, the engine notes that you've spent time on that page and will work on the fly to offer suggestions for related articles.

Privacy concerns about user information are moot with neural network algorithms, since they don't need to place users in clusters with related interests. Neural network algorithms respond to recent user actions—a more flexible approach than those of recommendation systems or forms-based questionnaires.

One of the potentially strongest players in this field is Autonomy (www.agentware.com), whose server software Agentware scans articles instantly behind the scenes, making it particularly suited to providing content rather than product recommendations. You can try the Autonomy News Agent at autonomy.virgin.net to see this approach for yourself.

Recommendation systems are fast and fairly accurate, but as more sites try to create personal views, look for alternative technologies such as neural networks to increase in popularity.—RVD

what's right for the user.

Besides its sample home site, WiseWire is currently developing a small business news service with Lexis/Nexis. For Webmasters, WiseWire technology can be licensed for corporate intranets. It runs on Microsoft Windows NT 4.0, Windows 95, and any SQL database, and it supports both Netscape and Microsoft Web servers.

WiseWire Corp.'s content-based approach is a natural fit with push technology, making this a company to watch as push becomes more prevalent. By concentrating on content rather than product-oriented collaborative filtering, WiseWire may have found itself a productive niche with plenty of room to grow.

WiseWire.com. WiseWire Corp., Pittsburgh; 412-688-8870; www.wisewire.com. Circle 444 on reader service card. □



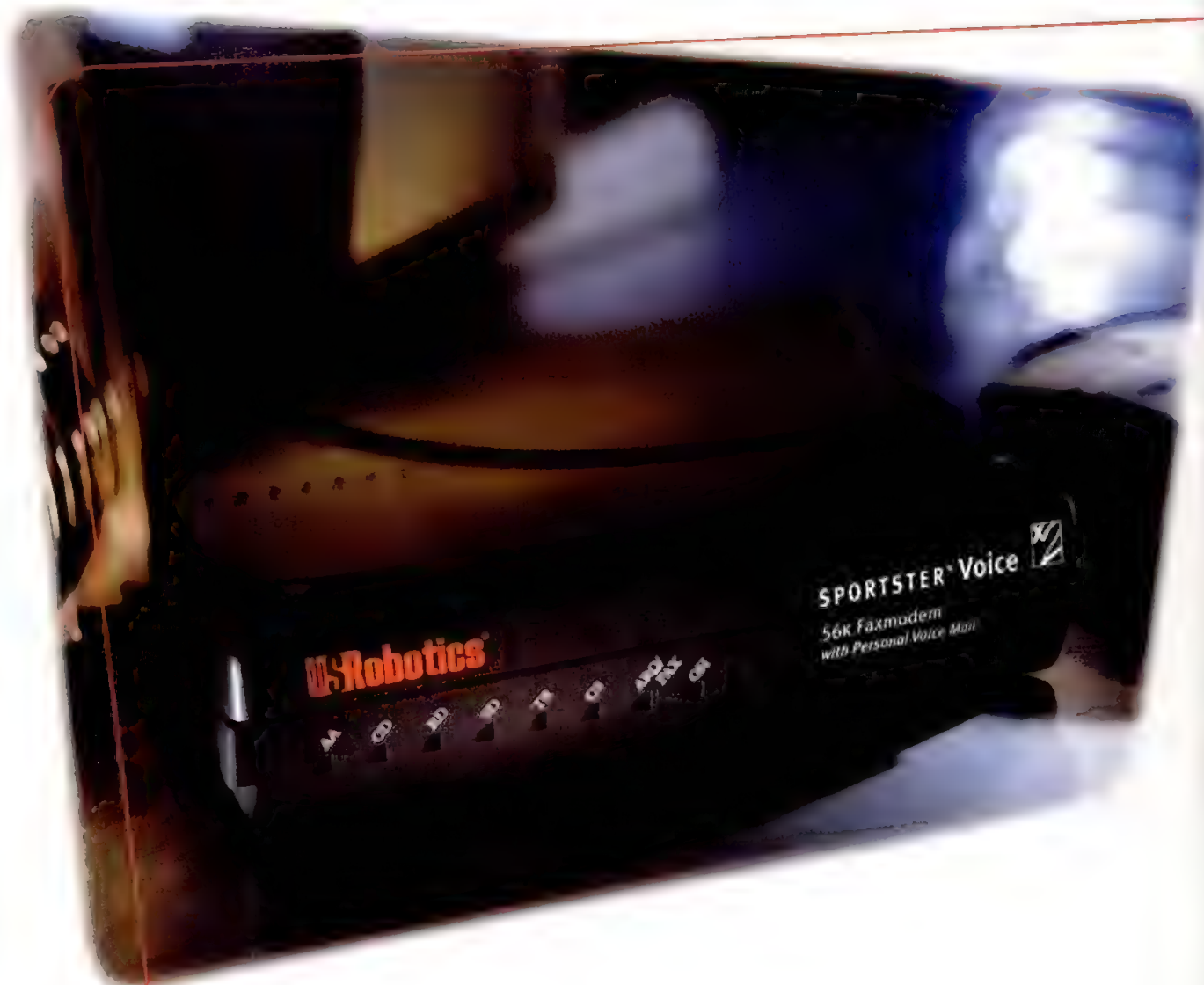
Still trying to decide
when to buy
a 56K modem?

Let us make it easy for you.

Now get

\$50

cash back.



SPORTSTER Voice 56k Faxmodem with Personal Voice Mail. The Sportster Voice 56k Faxmodem is a high-speed fax and modem. It features a 56k fax modem and a personal voice mail system. The device is designed for easy use and is compatible with most fax and modem software. It is a great addition to any office or home setup.

x2™ Delivers...even more.

x2 Delivers...cash back and more

Every day more and more information is added to the Internet. Like bigger data files, and richer graphics. You're going to need a faster modem than the 28.8K and 33.6K models out there now.

That's why we're making it easier for you to get the x2Technology 56K¹ modem, the fastest ever created for use with regular phone lines – by giving you \$50 (US) cash back.

x2 Delivers...high download speeds now

You don't need to wait to take advantage of this modem's superior download speeds. That's because x2 has already received the support of more than 800 Internet service providers (ISPs), from industry giants like IBM Global Services, America Online, Prodigy and NETCOM to smaller regional providers. In fact, more than 500 of them are live today, with many offering local access. That means you can start downloading at high speeds in all 50 states right now with x2.² It's that simple.

x2 Delivers...free upgrade to standard



You may have heard that the international 56K modem standard hasn't yet been defined (expected in 1998). That's why we're offering a no-risk guarantee of a free upgrade to make your x2 modem meet this new standard after it's approved. And since x2 uses DSP Solutions technology from Texas Instruments, it can easily be software-upgraded to receive future performance enhancements as they're developed.

x2 Delivers...guaranteed

To make it easier for you to experience x2 now, we're introducing "x2 Delivers More," a special program that will show you why buying an x2 modem now makes so much sense.



\$50 (US) CASH BACK

Now, instead of a free month of Internet service, we're offering a \$50 (US) mail-in rebate when you purchase a U.S. Robotics x2Technology 56K desktop modem by 10/4/97. It's a great way to help you get even more out of the Internet.

CONNECT NOW in all 50 states and Canada

Right now, more than 500 ISPs are live with x2, so you can connect regardless of where you live.²

FREE UPGRADE to standard³

After the new 56K ITU-T standard is approved, we'll upgrade your U.S. Robotics x2 Technology 56K modem to meet it – absolutely free.

30-DAY money-back guarantee

We're confident you'll be completely satisfied with your new x2 modem. If not, you can return it with your dated receipt within 30 days of purchase – no questions asked.

See the back cover for complete details of the x2 Delivers More program.

x2 Delivers...an easy choice

The ability to connect now in all 50 states and Canada. \$50 (US) cash back. A free upgrade to standard. A 30-day money-back guarantee. It simply couldn't be any easier. For more information, visit our Web site at <http://x2.usr.com/connectnow>, or call 1-800-525-USR1 to find an ISP near you that offers live x2 service.

Now download at high speeds with the company that connects more people to the Internet than any other. To get the speed you need, just remember one thing: x2 delivers even more than before.

U.S. Robotics



U.S. Robotics. From the leader in networking.



Tap serial number & bar code over this box

Internet Security

Protection At the Desktop



It wasn't all that long ago that unidentified floppy disks, too easily guessed passwords, and nosy colleagues were the biggest threats to desktop PC security. Those hazards have taken a back seat to the Internet, which exposes your PC to a whole new set of potential risks.

Sound paranoid? Perhaps. But what's undeniable is that security breaches aren't merely the stuff of legend. This year alone, we've seen many examples. Malicious programs with ominous-sounding names such as Win-Nuke have caused system crashes when downloaded from the Internet. In February, a band of hackers calling themselves the Chaos Computer Club reportedly used an ActiveX control to swipe money from one bank ac-

New client software lets you take Internet security and privacy into your own hands.

By Scot Finnie

count and deposit it in another—without a PIN.

The Internet has also given new impetus to an old security threat: computer viruses. One incident that garnered a lot of attention was AOL4-FREE, which started as a virus hoax and quickly turned into a real security threat when it was discovered that some AOL4FREE messages had Trojan horse programs attached. Thanks to the Internet, new viruses appear at the dizzying rate of more than 200 a month.

In this story, we review some of the products emerging to cope with these new threats spurred by the Internet. Our reviews are divided into three categories: personal security suites, cookie managers, and S/MIME



Personal Security Suites

Desktop Security Suite	152
eSafe Protect	152
SurfinShield Xtra	158



Cookie Managers

Complete Cleanup	159
Cookie Crusher 1.01	162
Cookie Master 2.0	162
Cookie Pal 1.0	166
Crumbler 97	166
IEClean32 and NSClean32	168
PGPcookie.cutter for Windows NT	168



S/MIME E-Mail

e-Mail 1.0	172
E-Mail Connection 3.1a	172
ExpressMail 2.0	178
MailSecure 1.0	178
Netscape Messenger	180
WorldSecure Client	180

www.pcmag.com

Visit our Web site for more coverage on security-related products, including smart cards and additional S/MIME e-mail clients, as well as links to the products reviewed in this roundup.

e-mail clients.

Personal security suites cover a lot of ground, from antivirus programs to data encryption to ActiveX and Java filters. Of

the three programs we tested, eSafe Technologies' eSafe Protect and Finjan Software's SurfinShield Xtra focus on monitoring ActiveX controls and Java applets. Cybermedia's soon-to-be-released Guard-Dog also falls into this category, but was not available in time for this story. By contrast, McAfee Associates' Desktop Security Suite is a toolbox that includes antivirus, encryption, personal firewall, and backup utilities.

Cookies sound innocent enough but have generated a lot of controversy. Basically, they are text files that Web servers store on your hard disk. Cookies can be

used to identify you to a Web server and recall information so you won't need to re-enter it each time you visit a favorite site. A common example is your log-on name and password for a particular site. Cookies can also be used to follow your online tracks, and this aspect has stirred privacy concerns. Cookie managers are programs that allow you to monitor and delete cookies. We tested seven of these inexpensive utilities.

As e-mail becomes a universal means of communication, the demand for more secure technology has increased. So-called security holes in browsers have created the potential for others to peek at your e-mail. Earlier this year, for example, Netscape released a patch to fix a hole that allowed others to read Netscape

Mail messages if you used Navigator 3.0 and Macromedia's Shockwave plug-in.

The only way to ensure your e-mail is kept private is to use strong encryption. S/MIME is emerging as the standard for universal e-mail encryption. Both Microsoft and Netscape have signed on to S/MIME, and other e-mail vendors are racing to embrace it. We tested six standalone or plug-in S/MIME products.

The odds of your data becoming lost or stolen online still seems remote. After all, the Web is a relatively young community, a neighborhood where few people lock their doors. But that community is rapidly growing into a city. Perhaps it's time you thought about installing some locks. These products can help.

Our Contributors: SCOT FINNIE and NEIL RANDALL are frequent contributors. SHERYL CANTER is a contributing editor. BEN Z. GOTTESMAN and LARRY SELTZER are technical directors at *PC Magazine*. JAY MUNRO and DIANE JECKER are project leaders and JOHN MORRIS was the associate editor in charge of this story.

What's in Your Browser

You may not realize it, but the browser you're already using, Microsoft Internet Explorer or Netscape Navigator, already includes some security features.

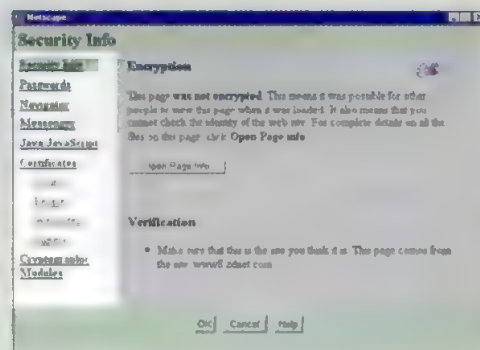
If you suffer from Internet paranoia, IE lets you shut off most potential avenues of attack. By default, IE accepts cookies, but you can also block them. Rather than turning off all these elements individually, you can set varying global security levels.

On a more practical note, IE tracks your personal certificate, which identifies you to Web servers. It also authen-

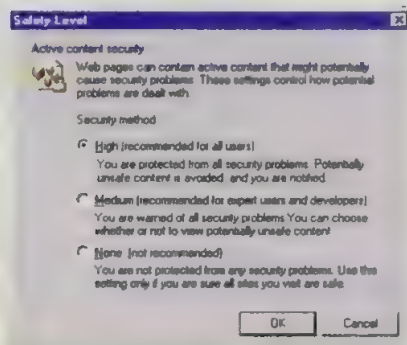
ticates the origins of files and sites using certificates. IE supports Secure Sockets Layer (SSL2 and SSL3) and PCT encryption schemes for secure connections, and the Microsoft Wallet lets you store credit card and other sensitive information securely.

Recently, Microsoft announced a series of security enhancements for the soon-to-be-released Internet Explorer 4.0 that may be available by the time you read this. IE4 will have *Security Zones*, which will let you set classes of Web sites and assign security policies for all sites in those classes. IE4 also will implement a capabilities-based Java security model and enhanced Authentication support. Microsoft maintains updated security information at www.microsoft.com/ie/security/update.htm.

Almost all security-related features in Netscape Navigator 4.0 can be set from the new Security Advisor dialog, which lets you manage your personal certificate, SSL, and other encryption-related settings. Addition-



Navigator's new Security Info dialog.



Internet Explorer's global security settings.

al features that you can set from the Advanced section of the Preferences dialog include the ability to shut off Java, scripts, and cookies, among other functions.

On the horizon for Netscape is Mission Control, a tool which will allow administrators to create custom versions of Communicator with company-wide security settings. Netscape maintains a security site with product information, FAQs, and white papers at www.netscape.com/assist/security.

—Larry Seltzer



Personal Security Suites

By Neil Randall

The technology media devote a lot of ink to the dangers the Internet poses to corporate computing. But even if you're working for a small business or at home, you should

still be concerned about security. During any normal browsing session, more happens to your machine than you're likely to be aware of, and you want a way to protect your system and the vital data it contains.

These days, any number of technologies insist on dumping viruses and other dangers in your system, and even the most vigilant users can't catch all of them. Nor do we necessarily know what to look for. Fortunately, software vendors have recognized the need for comprehensive, client-side security. For this story, we reviewed three personal security suites: McAfee Associates' Desktop Security

Suite, eSafe Technologies' eSafe Protect, and Finjan Software's SurfinShield Xtra.

The most obvious and perhaps best-known security risk is the threat of viruses. Desktop Security Suite includes McAfee's VirusScan, and eSafe Technologies (a division of Eliashim) bundles eSafe Protect with ViruSafe95. (We reviewed antivirus utilities in "The 1997 Utility Guide," April 8, 1997.) But these products are really designed to focus on more recent threats, especially from components downloaded from the Web. Java applets and ActiveX controls aren't just displayed in your browser; they're down-

loaded and stored on your hard disk. The vast majority of these files play nice, but you may run into some that are hostile or malicious—applets or controls that perform unwanted actions on your machine.

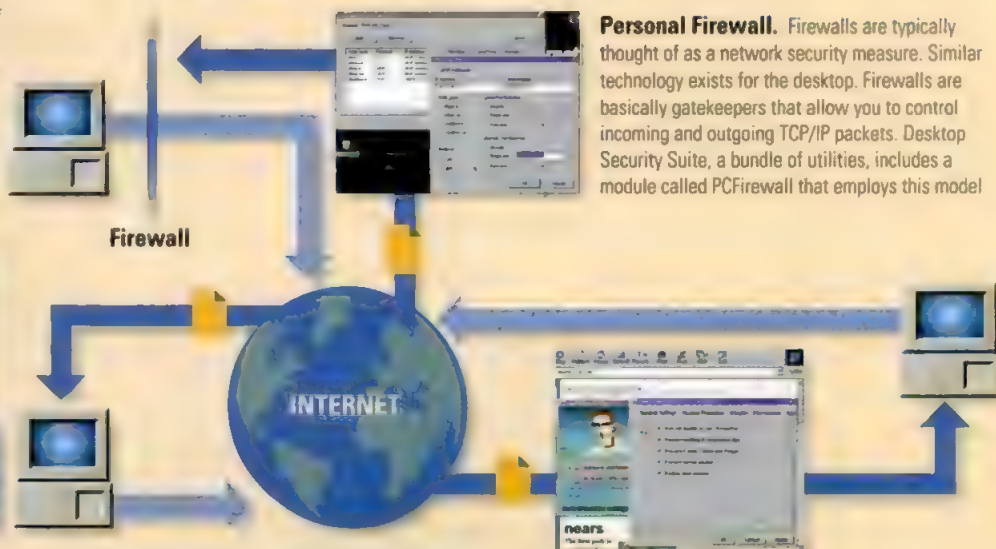
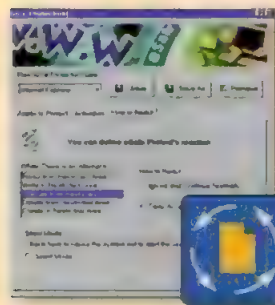
To minimize these threats, these security suites watch while you browse and alert you to potentially dangerous activity. Each takes a different approach, however. Desktop Security Suite includes a personal firewall module that allows you to restrict incoming and outgoing TCP/IP packets. The so-called sandbox model (similar to the security model employed by Java) that is used by eSafe Protect places incoming components into a safe area where they are not allowed to damage your system. Similar to an antivirus program, SurfinShield Xtra scans incoming Java applets and ActiveX controls for suspicious-looking code.

A direct competitor to SurfinShield Xtra and eSafe Protect, Cybermedia's GuardDog wasn't available in time for testing, but it will include protection against Java applets and ActiveX controls, plus antivirus software and cookie management as well.

Until recently, the only alternative was to block all components or to open the

Three Approaches to Security

The three personal-security suites reviewed here all offer some form of protection from potential threats on the Internet. Two of them, McAfee's Desktop Security Suite and eSafe Protect, also offer protection from viruses. Despite these similarities, each of the three employs a different security strategy.



Personal Firewall. Firewalls are typically thought of as a network security measure. Similar technology exists for the desktop. Firewalls are basically gatekeepers that allow you to control incoming and outgoing TCP/IP packets. Desktop Security Suite, a bundle of utilities, includes a module called PCFirewall that employs this model

The Sandbox. The sandbox security model has been popularized by Java, a programming language and environment that uses the sandbox to minimize the chances that a downloaded applet will damage your system. The sandbox is a safe area where programs such as downloaded ActiveX controls and Java applets are permitted to run without having access to the rest of your system. eSafe Protect has adopted this model.

Scanning. When you want to verify that there are no viruses on your system, you launch an antivirus program to scan all your drives. It compares your files with a library of known viruses to ferret out any suspicious code. Finjan's SurfinShield Xtra applies a similar process to ActiveX controls and Java applets before you download them. Suspicious code is never allowed to reach your system, but scanning may slow system performance.



PCFirewall is one of several applications in Desktop Security Suite. Here it is set to a completely open policy (detail).

floodgates, and neither of these is a sound security policy. That's beginning to change, however, as Microsoft and Netscape add new security features to their browsers (see the sidebar "What's in Your Browser"). But neither browser can match the protection of a dedicated suite. Of course, the price for this protection can be a loss of convenience. But if you configure them properly, these suites can serve as valuable browsing bodyguards.

McAfee Associates Inc.

Desktop Security Suite

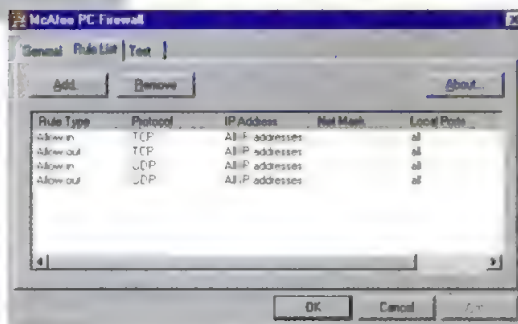
Unlike the other security suites reviewed here, McAfee's Desktop Security Suite (DSS) doesn't aim to protect you from hostile Java applets or ActiveX controls. Instead, McAfee has focused on data encryption, virus protection, and secure data backups. DSS (\$100 street) is therefore best used in conjunction with one of the applet suites, because together they give you pretty much all the desktop security you could ask for.

DSS ships with five installable modules. The first is the company's flagship product, VirusScan, which offers your system full virus protection. It also watches for viruses as you download files from the Internet (or other machines), cleaning infected files before they damage your system.

QuickBackup offers security against hard disk crashes caused by malfunctions, viruses, or hostile applets. You can back

up to any local drive (including tape), as well as to an FTP site. The latter option can be extremely handy if you have access to a second machine over the Internet. McAfee also offers the Vault, an FTP site for backups (\$10 per month for up to 30MB of storage space). And if you're working on a network or if you have your machine set up as a server, you'll like the third module, PC Firewall, a cost-effective way to set up a firewall for small networks.

But the real personal security in this package lies with the two encryption modules: PCCrypto and Net-



Crypto. The first is concerned with local files, and the second with over-the-network activity. You can archive up to a thousand files using either the 40-bit PC1 or the 160-bit Blowfish algorithm. NetCrypto carries security a step further, allowing you to

specify encryption policies between networked machines (including Unix machines). You can also automatically encrypt your QuickBackup sessions. One word of caution: During testing, NetCrypto interfered with the TCP/IP stack in Windows 95 by installing its own version of the Wsock32.dll file and then failing to return the original of that file to a working state when uninstalling. This caused further problems with Internet access. Once McAfee corrects that significant problem—which should be addressed in Version 2.0—this security toolkit will be highly recommend.

Desktop Security Suite. Street price: \$100. Requires: 486-based PC or better, 8MB RAM, 11MB hard disk space, Microsoft Windows 95 or later. McAfee Associates Inc., Santa Clara, CA.; 800-332-9966, 408-988-3832; fax, 408-970-9727; www.mcafee.com. Circle 450 on reader service card.

eSafe Technologies

eSafe Protect

With a unique approach to Internet security, eSafe Protect (\$70 street) allows you to download elements, but it isolates them in a safe area, known as a sandbox, where they can't do any damage. A division of antivirus vendor EliaShim, eSafe Technologies also bundles antivirus software with eSafe (for more information see "The 1997 Utility Guide," April 8, 1997).

SUMMARY OF FEATURES

Security Suites

	Desktop Security Suite	eSafe Protect	SurfInShield Xtra
Price	\$100 (street)	\$70 (street)	\$120 (street)
Products listed in alphabetical order			
Virus protection	■	■	■
Hostile Java applet protection	■	■	■
Hostile ActiveX control protection	■	■	■
Plug-in protection	■	■	■
Push-item protection	■	■	■
Prevents access to system resources	■	■	■
Prevents access to local files	■	■	■
Prevents access to modems	■	■	■
Configurable security levels	■	■	■
Destroys hostile applets automatically	■	■	■
Restricts access to specific sites	■	■	■
Restricts incoming IP addresses	■	■	■
Blocks items from entering system	■	■	■
Uses secure sandbox to isolate items	■	■	■
Controls time usage on Web	■	■	■
Encrypts local files	■	■	■
Encrypts files sent over the Internet	■	■	■
Encrypts backup files	■	■	■
Encrypts e-mail files	■	■	■

Breakthrough Size



Breakthrough Price

"We definitely need large screen displays to run our graphics programs. However, there isn't room in our small office for big 21" (various viewables) monitors. When we saw the 19" (18.0" viewable) Optiquest V95, we knew we'd found a winner."

Talk about breakthrough size! Optiquest® took the concept of a large screen 21" (various viewable) monitor, combined it with the small footprint of a 17" (various viewable), and created a brand new display – **the 19" (18.0" viewable) V95 monitor.**

Imagine! A screen large enough to handle graphics, business and Internet applications for PC and Mac® systems, yet small enough to fit into the limited space of a small office. In fact, the 19" (18.0" viewable) Optiquest V95 delivers the best of a traditional 21" (various viewable) screen, but costs approximately 45% less.

This display offers impressive performance with its 1,600 x 1,280 maximum resolution, 95kHz horizontal scan rate, super fine 0.26mm dot pitch for sharp, crisp images and a flat

square screen. And it also includes OnView® controls for simple on-screen adjustments – all at the affordable Optiquest price. Plus it's backed by a limited three-year warranty.

Why settle for less? Get the best of both worlds – large screen performance in a small footprint. **Call 800-843-6784**, ask for agent 6527 to obtain the name of the dealer nearest you.

All business decisions should be this easy!

OPTIQUEST®

A ViewSonic® Company

438 Cheryl Lane, Walnut, CA 91789
(800) 843-6784
 Internet: www.optiquest.com

Corporate names and trademarks stated herein are property of their respective companies. Specifications subject to change without notice. Copyright ©1997 ViewSonic Corporation. All rights reserved.



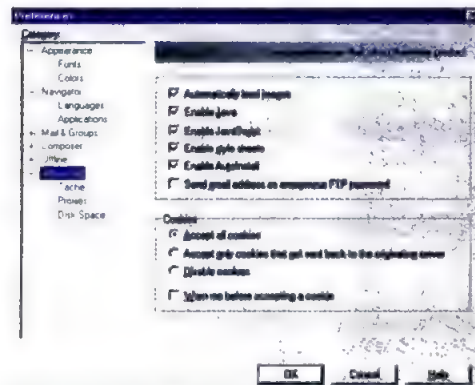
CIRCLE 118 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

Dangerous Downloads?

If you read computer publications or even a newspaper, no doubt you've seen the numerous stories about security breaches involving Microsoft Internet Explorer and Netscape Navigator. Many of these security concerns revolve around ActiveX controls and Java applets, programs that you download while Web browsing, often with-

out doing damage to anything located outside a circumscribed area. The Java sandbox prevents applets from reading or writing files or interacting with other parts of the system.

If you don't trust code, sandboxing is a good thing. You can be reasonably certain that nothing can go wrong. The trade-off is that, without being able to read and write files, applets are severely limited in what they can do. JavaSoft has responded to these limitations by creating, in Version 1.1 of its Java Development Kit, the ability to sign and trust applets, just like Authenticode in ActiveX. In JDK 1.1, signed applets can run outside the sandbox. Like ActiveX controls, these certified applets would have the *potential* to do malicious things to the system by way of reading and writing files. Meanwhile, Microsoft is investigating the potential for adding sandbox



Netscape Navigator's Advanced settings let you restrict downloads.

out even knowing it.

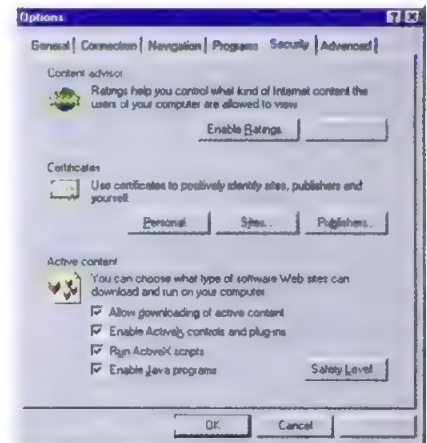
The vast majority of these programs are innocent and are designed to enhance the browsing experience. But in some cases, they can potentially damage your system. To minimize the risks, both ActiveX and Java include security features. But there are significant differences between ActiveX and Java in both their capabilities and levels of security. The bottom line is that both ActiveX and Java have security problems. ActiveX doesn't have enough security, and Java has too much.

ActiveX controls and Java applets are small programs typically designed to make your browsing experience more interactive. Based on the Component Object Model (COM), ActiveX controls are written in native code for a specific platform such as Windows. When you encounter a page that uses an ActiveX control, the browser can install and run it dynamically. Java is an interpreted language that can run on multiple platforms using a virtual machine. When you download a Java

applet, the browser's Java virtual machine translates it into native code so the system can run it. Because ActiveX controls are native programs, they can do all the things native Windows programs can do. For instance, they can read and write files, perform network administration, determine the capabilities of the system they are running on, and so on. The advantages of this are that ActiveX controls are more powerful than Java applets, and they can greatly outperform interpreted Java. The disadvantage is that, because they are more powerful, ActiveX controls could also be used to compromise the security of your system.

For this reason, many argue that ActiveX is inherently insecure. There's a kernel of truth to this, but there's also a lot of exaggeration. Just because something is technically possible doesn't mean that it's plausible, and to date there have been relatively few reports of malicious ActiveX controls. More to the point with ActiveX, there are things you can do to protect yourself. IE allows you to disable ActiveX controls completely if you wish. Of course, if you do, you'll miss out on some of the experience of Web sites using ActiveX. IE also supports a feature called Authenticode, which uses digital signatures to identify each control as having been written by a particular author. By checking the signature with a known verification authority, the most well-known being Verisign Inc., you can know with confidence that the control you downloaded, but have not yet installed, is from a particular author. You can then decide whether you trust that author.

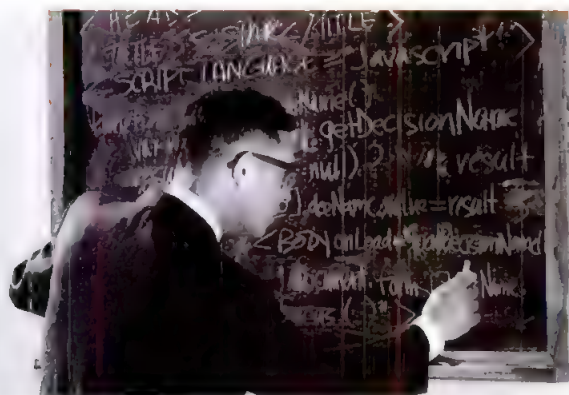
An alternative approach to security is the *sandbox*. This is the method chosen by Sun Microsystems for its Java programming language and environment. The sandbox is a metaphor for a space that programs can "play" in



All ActiveX and Java settings are in one place in Microsoft Internet Explorer.

techniques to ActiveX. Under Windows NT, this is not difficult to imagine. Microsoft could run ActiveX controls in a more restricted security context, but solving ActiveX's security problems under Windows 95 may prove to be far more difficult. And it's still not clear what security problems will turn out to be truly significant, or what technologies will be adopted to address them. Stay tuned.—Larry Seltzer

Are you still designing Web pages the way they did way back in 1996?



Technology does move pretty fast these days. So why are you waiting so long to put up a Web page? Especially when



Visual Page™ makes it so quick and easy.

You don't have to learn a brand new

application. Visual Page looks and

feels just like the ones you already know. You don't have to keep jumping between Visual Page and your browser like other authoring programs. What you see on your page is exactly what you'll see in your Web browser. And when you're done, you can publish to the

Web in one easy step. You don't even have to get any special training. Professional templates help you get started. Bullet lists, tables and frames are a snap. With power like this, you don't have to worry about outgrowing it.



As the leader in Java™ tools, we even make adding Java drag-and-drop easy. So now you have no excuse for working the old-fashioned way. **Download a 30-day free trial** of Visual Page from cafe.symantec.com.

Or call us today at 1-800-852-1118, ext. 91121 for more information.

Now available for Windows 95 and NT.

SYMANTEC.®

Symantec is a registered trademark and Visual Page is a trademark of Symantec Corporation. Java is a trademark of Sun Microsystems, Inc. Macintosh is a registered trademark and the Macintosh OS logo is a trademark of Apple Computer Inc. used under license. Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation. All other brand names or trademarks are property of their respective owners. ©1997 Symantec Corporation. All rights reserved. In Canada, call 1-800-365-8641. In Australia, call 02-9850-1000. In Europe, call 31-71-535-3111.

ANTI

GRA



Web sites are inherently chaotic beasts. They require constant feeding, updating, redesigning. And if you're trying to keep up with it all, that means relinking and recoding and a lot of 12-inch pepperoni pizzas at your desk. For those of you who have better things to do, may we suggest NetObjects Fusion.™ It eats chaos for lunch. So, go design your site. Build your site. Update your site. Do good.



The Web needs you. 1-800-328-2521, dept. 9KBA.

www.netobjects.com/chaos/pcmagazine

NETobjects™

CIRCLE 149 ON READER SERVICE CARD

Using eSafe is a bit strange, because it often doesn't seem to be doing anything. If you point your browser toward a hostile applet, eSafe will allow you to download it, unlike SurfinShield, which should block it. The difference is that eSafe won't allow the downloaded applet or ActiveX control to do anything malicious. Ultimately, eSafe effectively protected our system.

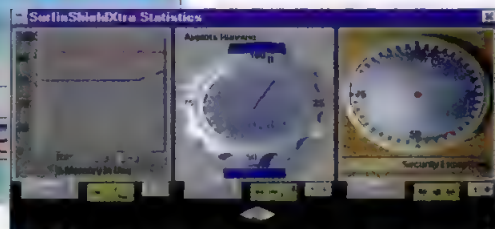
eSafe protects against hostile Java applets, ActiveX controls, push programs, and plug-ins. It is completely configurable. In addition, you can control access to files and directories on your local hard disk, as well as those on FTP servers and Web sites. It will monitor the TCP/IP stack to protect against intrusion from unwanted IP numbers, and it can even control how much time you spend on the Web.

All of these settings are accessible from the extensive Advanced Configuration dialog. Here you can specify precisely what steps eSafe should take if a violation occurs. You can even (manually) establish forbidden words in URLs or text, so that whenever they appear, eSafe will either stop the download from occurring, ask you how to handle it, or simply ignore it (depending on your configuration). And you can get updates from the eSafe Web site containing new virus definitions and lists of sites that may pose security risks.

In theory, eSafe's sandbox approach should translate to less of a performance hit than scanning solutions such as SurfinShield. The public beta of eSafe we tested did seem to cause performance problems, especially during virus checking, but that may be corrected in the shipping version. A promising product, eSafe allows you to



SurfinShield Xtra displays a separate button for each active applet. The statistics window (detail) shows applet activity and security risks.



play safely on the Internet.

eSafe Protect. Street price: \$70. Requires: 486-based PC or better, 8MB RAM, 4MB hard disk space, Microsoft Windows 95 or NT 3.51 or later. eSafe Technologies, Pembroke Pines, FL; 800-477-5177, 954-450-9611; fax, 954-450-9612; www.esafe.com. *Circle 451 on reader service card.*

Finjan Software Ltd. **SurfinShield Xtra**

Finjan Software was the first to test the Web security waters, with the release a year ago of SurfinBoard 1.0. Since then, Finjan has upgraded and renamed the product—now called SurfinShield—and most recently launched a new version, SurfinShield Xtra (\$120 street), which adds ActiveX monitoring and control to the mix. We tested SurfinShield Xtra.

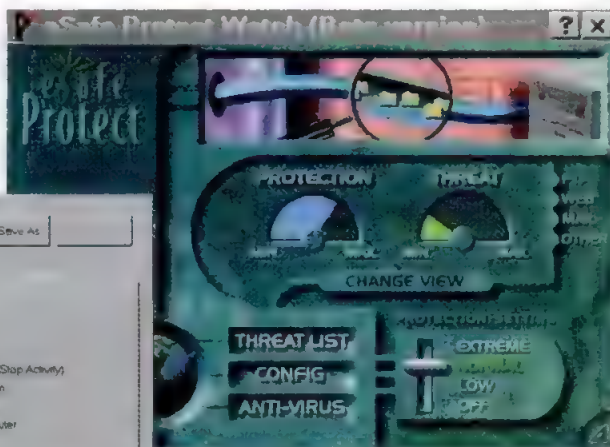
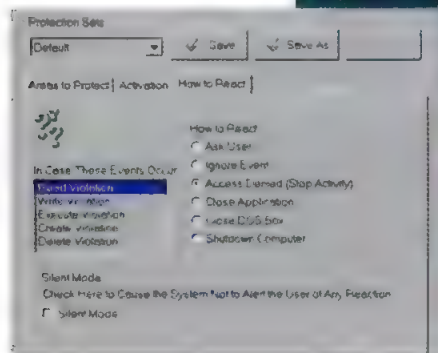
SurfinShield Xtra sits in the background and watches for Java applets and ActiveX controls. When your browser attempts to download an applet or control, SurfinShield Xtra scans the item in a fashion similar to antivirus programs. If the program determines the applet or control is "suspicious," it will block you from downloading

it. By default, SurfinShield Xtra deems any applet that attempts to write to a file or start a process on your system as suspicious; you can change this parameter. With ActiveX, SurfinShield Xtra prevents controls from accessing any directories other than those it needs for basic functioning. Applets and ActiveX controls are permitted to access the Windows registry.

Whenever SurfinShield Xtra encounters an applet or control, it creates a button for that item in the Active Applets area of the main window. Clicking on the button gives you the URL for the item, as well as an indicator of its potential security risk. You can mark the item as suspicious; SurfinShield Xtra calls it to your attention, and then you decide what you want to do.

To see if SurfinShield Xtra is working properly, call up the suspicious-applets database and enter one of the URLs into your browser. When the item tries to load, your browser's status bar will tell you that it is a security violation and has been refused. SurfinShield Xtra's default is configured to kill all items with a security violation and to prevent suspicious items from loading. You can alter the default settings to suit your needs and specify how much weight you want to assign to a wide variety of security processes.

Your personal Web performance may suffer, because SurfinShield Xtra often stops resources from downloading. Once you adjust your preferences, though, you'll find the package a far greater help than a hindrance. A 30-day trial version is available at Finjan's Web site. It's worth a look. **SurfinShield Xtra.** Street price: \$120. Requires: 486-based PC or better, 2MB hard disk space, Microsoft Windows 95 or NT 3.51 or later. Finjan Software Ltd., Santa Clara, CA; 408-562-6100; fax, 408-562-6105; www.finjan.com. *Circle 452 on reader service card.*



eSafe Protect's interface shows the protection and threat levels. You can specify how the program should react to potential threats (detail).



Cookie Managers

By Neil Randall

Cookies, otherwise known as *persistent cookies* or even *magic cookies*, were meant to make life easier for Internet users. They are really nothing more than small

strings of text characters sent to your hard disk via your browser while you're visiting a Web site. Such a character string stores certain pieces of information about you, and when you return to the same Web site, that information is passed back to the Web server. This exchange was designed to alleviate the "stateless" nature of the HTTP protocol. If the site you're visiting requires a sign-on, for example, you'll have to do it only once. Cookies also form the basis of the shopping-cart concept in electronic commerce, allowing you to leave the site and return later to find the originally selected items still in your cart.

The controversy about cookies stems from two facts. First, they place information on your hard disk, and that's something we're all wary of. Second, they function in the background, mostly without your knowledge. As cookies pass information back and forth with each visit, they eventually build detailed user profiles, which are often used by third parties to deliver targeted advertisements to Web site visitors. Given the growing concern about privacy on the Internet, it's no surprise that this activity is drawing consumer interest.

That's where cookie managers come in. These inexpensive utilities let you

monitor and control cookies. We tested seven of them for this story.

For the most basic cookie management, you don't need a third-party solution. Both Microsoft Internet Explorer and Netscape Navigator have options for blocking cookies. These are limited solutions, however, and it's more practical to use a dedicated utility.

Three types of cookie managers have emerged. The first simply blocks all cookies, refusing them without asking. The second lets them arrive at your machine, then offers you the ability to wipe them all out in one swoop. The third, and most sophisticated, gives you more options, such as blocking cookies from specific sites and even deleting cookies individually. Which you choose depends entirely on what level of protection you feel you'll need.

SoftDD

Complete Cleanup

Unlike other cookie utilities on the market, Complete Cleanup (\$30 street) acts as a cleaner, getting rid of the debris—cache files, history files, and cookies—other programs leave behind.

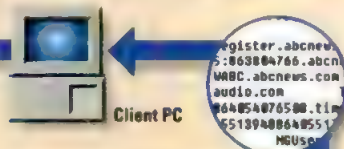
To use the program, all you have to do

How Cookies Work

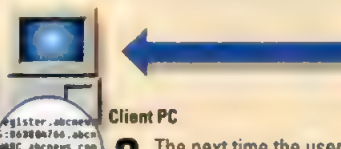
A cookie is a small string of text that a Web server can transmit to your browser and store on your hard disk. When you launch your browser, the cookies are loaded into memory, and if you return to a site that set a cookie, the Web server can recognize your browser and return specific types of information. The vast majority of cookies are designed to enhance

the browsing experience. Some of their uses include storing user IDs and passwords, personalizing start pages, recalling the items placed in an online shopper's cart, tracking where users go within a site, and building profiles of consumers for displaying targeted ads. This last category has generated the most controversy, but it remains a prevalent practice.

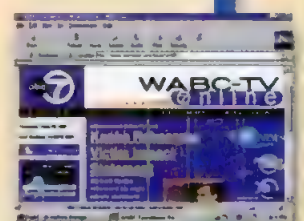
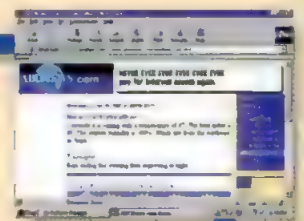
1 In the example shown here, a user visits ABCNews.com for the first time. In addition to providing a user ID and password, the user selects a city and state and a local affiliate.



2 The ABCNews.com server transmits a cookie containing that information to the browser. The new information is clearly visible in the Cookies.txt file.



3 The next time the user returns to ABCNews.com, the server recognizes the cookie and automatically delivers the weather forecast from New York's La Guardia Airport and provides a link to the WABC-TV affiliate for retrieving local news—all without the user entering an ID or password.



Web server

Web server

Automatic Email Retrieval and Delivery!

EZMail™ delivers your email to you wherever you are! This amazing new product automatically notifies you of new email by an on-board flashing yellow LED or by your pager. User defined filtering ensures only important email is delivered to you via your printer, fax machine, or alpha-numeric pager. **EZMail™** supports four dial-up email accounts simultaneously and checks for new email at intervals that you define. Best of all, after initial set-up **EZMail™** does not require a dedicated PC to operate. Now you can take your notebook PC on the road with you and still receive critical email wherever you go!

**Retrieve
Your Email
Without A PC!**

**EZMail™ Dials Up Your Internet Service
Provider (ISP), Retrieves, Filters and
Delivers Your Email To You By...**



Features & Bonofits:

- Ideal business tool for small offices or home, offering users a more productive way to use email on the Internet.
- Internet users can easily and instantly get email messages for up to four accounts-without a PC after initial set-up.
- Automatic retrieval and notification of new email messages eliminates the tedious task or manual log-in to the Internet.
- Retrieves email messages from multiple Internet Service Providers.
- Robust filtering options let you filter email for important messages or screen your email for only the email that you want.
- Delivers email messages directly to your printer, local fax machine, remote fax machine or alpha-numeric pager.
- Redirect email from anywhere to anywhere with a control email message.
- Easy set-up with **EZMail's™** intuitive installation wizard with Windows 95, Windows 3.x, and Windows for Workgroups.



1914 Junction Avenue
San Jose, CA 95131
www.asp.net
aspsales@asp.net

©1997 ASP Computer Products. All Rights Reserved.

**Ordering
Information:
1-800-506-9604**

Hassle-Free® Connectivity!

AD CODE: EZMAG



SAFEGUARD
Interactive

TM

BACKUP

www.sgi.com

BACK UP YOUR DATA AUTOMATICALLY VIA THE INTERNET

THE BETTER SOLUTION TO TAPE BACKUP

Experience a secure and hassle free, automated backup solution.

Safeguard Interactive, the leading data backup storage and retrieval service eliminates the difficulties of tape/zip drive backups. Ideal for small offices and working on the road. Your data is available via the Internet – anytime, anywhere.

Totally confidential BACKUP uses DES II military grade encryption. Data is encrypted and compressed before it leaves your PC, making transmission completely private.

Fast Safeguard compression techniques lets daily backups run in minutes.

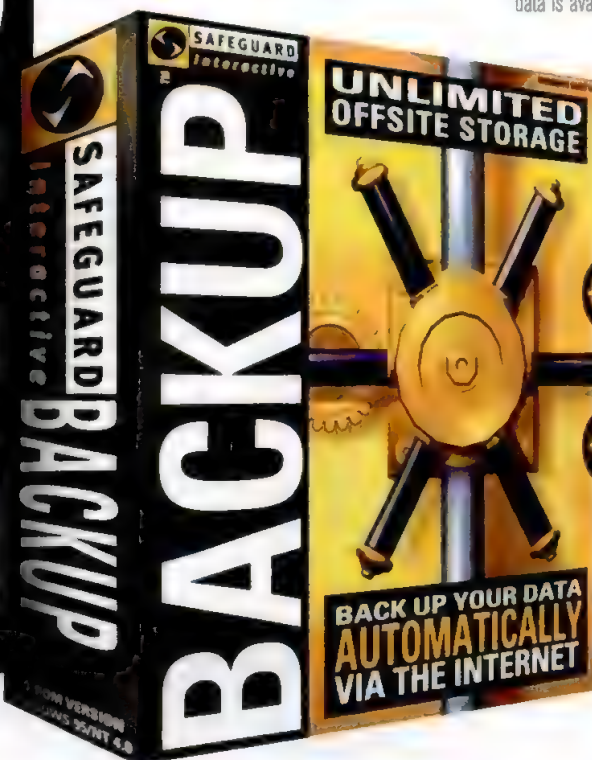
Easy to install and use No hardware to purchase. No media nuisance.

Unlimited offsite storage The ultimate protection against data loss. Protects your critical data (accounting databases, client records, payroll) by storing it at two separate, secure locations.

Automatic No more of those "end of the day" backup hassles. You can run a manual backup or schedule automatic backups for every day of the week. Safeguard Interactive BACKUP automatically dials your Internet Service Provider, transmits data, reestablishes the connection if transmission is broken, and disconnects when backup is complete.

Personal disaster recovery solution

Recover lost data easily. Our data management system allows you to point and click on backed up data to recover. If you upgrade to a new PC, experience a total data disaster, or just need your data close-at-hand, an overnight CD-ROM copy of the data is available at a nominal charge.



"...there's no limit on the amount of data and files you can store on Safeguard's server, a big plus over some of the other services that charge by the megabyte."



**ONLY
\$29.95**

- Software plus 3 month subscription
- Low flat monthly renewal rate
- Free automatic upgrades
- Unlimited customer support
- 30 day money back guarantee



COMPU



BOOK

ELECTRONIC

SP

FRY'S

MICRO CENTER

Office DEPOT

GLOBAL

STAPLES, Inc

OfficeMax

SUN TELEVISION

MicroWAREHOUSE

PC CONNECTION

Zone

Tiger Direct!

PeMail

©1997 Safeguard Interactive, Inc. All rights reserved. Safeguard Interactive BACKUP is a trademark of Safeguard Interactive, Inc. All other company or product names are registered trademarks of their respective companies.

CIRCLE 169 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

Editors' Choice

• CookiePal 1.0



Cookies are a simple technology. And they call for a sim-

ple solution for those who are uncomfortable with cookies and their potential uses. Kookaburra Software's CookiePal 1.0 delivers on this count.

CookiePal, which runs in the background while you're browsing, consists of a memory-resident monitor and a cookie management utility. If a Web server attempts to pass a cookie to your system, the monitor alerts you. You can specify not only whether you want to accept or reject that cookie but

whether you want any cookies from that server in the future. CookiePal's tabbed dialog box shows you all cookies currently stored with IE and Navigator. From there, you can delete cookies, find the ones that have been downloaded in a current session, and build filters for accepting or rejecting cookies from particular sites.

We also were impressed with Kevin McAleavey's IEClean32 and NSClean32 utilities for IE and Navigator, respectively. Neither can monitor cookies in the background, but they both provide more comprehensive security by erasing newsgroup activity, clearing out cache files and history databases, and more. Although Pretty Good Privacy's PGPcookie.cutter is currently only available for Windows NT, it also deserves mention for its strong feature set.

is run it. There's no installation routine, just a single executable file. Double-click it and you see a dialog box showing the number of cache files found for Netscape Navigator and Microsoft Internet Explorer, as well as the number of history files for Internet Explorer. Complete Cleanup helpfully tells you how much disk space these files are eating up.

You can delete the files in the cache of either browser, or you can delete the cookies in either browser. Furthermore, you can delete the history files in Internet Explorer. Or you can go whole hog and click the Cleanup All button, getting rid of cache, history, and cookies simultaneously.

Complete Cleanup has a few drawbacks. First, you can't choose which cookies, history, or cache items you want to eliminate; you either keep them all or get rid of them all. In addition, at least the early versions of the utility demand that you install browsers in the default directories specified by the IE and Navigator setup programs. And, of course, you can delete your cache and history files from the options or preferences dialogs of the browsers themselves without Complete Cleanup. Still, for one-stop cyber cleansing, it is a solid, simple utility.

members.aol.com/softdd. Circle 453 on reader service card.

The Limit Software

Cookie Crusher

Another entry in the "see a cookie, kill a cookie" line of cookie management, Cookie Crusher 1.01 (\$10 list) sits in the background as an icon on the Windows task tray, waiting for cookies to make their appearance in Microsoft Internet Explorer or Netscape Navigator. Cookie Crusher then automatically rejects them and saves you the manual step of doing so. In fact, in order to work, the utility requires that your browser's cookie notification be turned on.

When Cookie Crusher is first installed, it doesn't do anything. To get it working, you have to double-click the

tray icon and bring up its minimal dialog box. After you select Internet Explorer or Navigator, the program starts watching for incoming cookies. When it sees them, it destroys them and doesn't give you a choice or a record of what it has done.

You can tell the program to load your browser whenever you load Cookie Crusher itself—not a bad idea if you want to monitor your cookies continuously. If you have Cookie Crusher running, it can automatically begin monitoring when you launch your browser. To enable this method, you have to click in the Cookie Activate Settings area of the Configurations and Settings dialog. In our testing, this version of Cookie Crusher proved unstable. And at this time, we recommend you look elsewhere.

www.thelimitsoft.com. Circle 454 on reader service card.

Barefoot Productions

Cookie Master

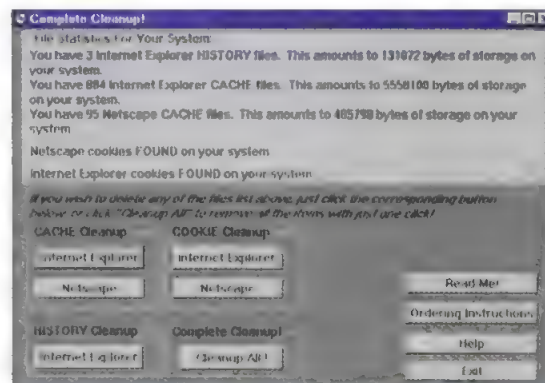
A very simple application, Barefoot Productions' Cookie Master 2.0 (freeware distributed by ZDNet) is quite a useful cookie-control program.

Cookie Master's utility is evident from the moment you install and begin running it. The program easily locates your browser by scanning the Windows Registry, allowing you to change the path for both the browser's executable file and the cookie file if your Registry isn't correct for some reason. Cookie Master works with both Microsoft Internet Explorer and Netscape Navigator.

CookieMaster's real power lies in its ease of use and convenience. It doesn't work in the background, and it provides

you with access not only to cookie files and directories but, more importantly, to each cookie. The vast majority of cookies are not harmful to you, so blocking them altogether—which is the approach that browsers and simple cookie managers espouse—is usually overkill. From the program's viewer, you can select cookies one by one and then proceed to delete them individually or together.

Two features we would like



Complete Cleanup shows a complete summary of your history, cache, and cookie files.

WHAT HAS ALEX TREBEK'S MIND SPRINGING?

The answer is MindSpring. Its noggin bobbing access takes you direct to the Internet. There's no question it's the intelligent choice for a fast, reliable and easy-to-use Internet connection. No delays. No detours. You go direct to the Internet. Call **1-800-434-0982, ext. 1904** now for your free software.

MindSpring offers you an excellent software suite—with a top-rated browser, great e-mail, newsgroups, plus premium news and stock services with most plans. So, don't jeopardize your online experience with just any Internet service. Get MindSpring—the national Internet service provider that's heads above the crowd.

With MindSpring you get:

- Free 24-hour technical support
- Free Web space with most plans – 5 to 10 MB
- Flexible pricing – from as low as \$6.95 to \$19.95 a month for unlimited access
- Free software for Mac or Windows – Call **1-800-434-0982, ext. 1904**
- And a no risk, 30-day money back guarantee

What the Experts Say:

PC World: MindSpring "works well and is easy to use" and "their support people were among the friendliest, most helpful we found."



CNET: MindSpring ranks among the top five national ISPs in a user satisfaction survey conducted by CNET.



PC Magazine: MindSpring's "strong software package and excellent customer service will be popular" and "the software suite includes some of the best Internet tools... the software is easy to set up and requires little configuration."



NetGuide: MindSpring wins 1997 People's Choice Award in the category of Best Internet Service Provider.



U.S. Robotics: MindSpring now supports U.S. Robotics 56Kbps technology in select locations.



MindSpring™

Direct To The Internet.

www.mindspring.com

Call now and receive your FREE MindSpring Software (CD-ROM).

1-800-434-0982 ext. 1904

No risk, 30-day money back guarantee.

Hurry, offer expires September 30, 1997.

© 1997 MindSpring Enterprises, Inc. All other names are trademarks or registered trademarks of their respective holders.

CIRCLE 089 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink



Arthur van Hoff

Chief Technology Officer, Marimba, Inc.
Author of Java Compiler

The best Java™ development tools? Ask the guy who co-created Java.

While we'd like to think Symantec's Café™ IDE is Arthur van Hoff's best friend, this particular distinction goes to his buddy Trix (that's him on the right - the one with four legs.)

Which is not to say we don't rank high on van Hoff's list. Recently, we asked the co-creator of Java what he likes in a development environment. And why he chose Symantec's Java tools.

"You want your tools to be so fast and natural to use that they're like a part of your mind, so you can get into that zone where you're working at the speed of thought.

"Symantec's Café compiler is really, really fast, and it's configurable to the way I work. It's a great environment that will boost any developer's productivity."

Other considerations? "Compatibility," van Hoff says. "I want 100% compatibility with Sun's JDK. Symantec's JIT runs on

Sun's standard JDK, which is an absolute requirement."

Van Hoff has put these and other Symantec assets to work in the creation of his company's dazzling new Castanet™ channel publishing system, designed to automatically distribute and maintain software applications and content within a company or across the Internet. "Soon, you'll be able to seamlessly publish Castanet channels with Symantec tools," he adds.

That's just one more advantage of choosing Symantec. For plenty of others, please call or visit our website today.

Call for a **FREE** trial copy!
1-800-453-1059
ext 91118

Or download from:
<http://cafe.symantec.com>

SYMANTEC™



Symantec and the Symantec logo are registered trademarks and Symantec Visual Café and Symantec Visual Café Pro are trademarks of Symantec Corporation. Java is a trademark of Sun Microsystems, Inc. Microsoft and Windows are registered trademarks of Microsoft Corporation. All other brand names or trademarks are the property of their respective owners. ©1997 Symantec Corporation. All rights reserved. In Canada, call 1-800-365-8641. In Australia, call 02-9850-1000. In Europe, call 31-71-535-3111. Free trial copies of Visual Café only, while supplies last.



Now there's an easier way to take your local Internet connection with you when you travel.

- **Virtually anywhere you go.**

HomeGate™ lets you access your email in 155 countries worldwide.

- **It's the easy way to stay connected.**

With HomeGate, your email and the Internet are always just a local call, and a few clicks away.

- **Anyone can use HomeGate.**

It doesn't matter who your home Internet service provider is.



To learn more, or to download free HomeGate software, visit us at **www.homegate.net**. For additional information, contact one of our HomeGate offices.

United States	1-310-533-3950
Hong Kong	852-2851-8884
Switzerland	41-31-305-0407

HOME GATE

Simply. Smart. Simply. Connected.



HomeGate is a member of the i-Pass Alliance.

to see Cookie Master provide with Navigator (as it already does with IE) are the abilities to monitor individual cookies in the background and to keep the browser open when refreshing the list of cookies. But as it stands, Cookie Master is still worth the download.

www.hotfiles.com. Circle 455 on reader service card.

Kookaburra Software

Cookie Pal



In one concise and easy package, Cookie Pal 1.0 (\$15 street) offers everything you need in a cookie manager. It locates your installed browsers automatically and lets you control and delete cookies selectively.

Cookie Pal comes in two parts: a monitor and a cookie management utility. The first part is the live, interactive Cookie Pal monitor that notifies you when your browser is being asked to accept a cookie. When the cookie indicator pops up, you can tell it to accept or reject the cookie, or you can specify that you want to accept all or none from that server in the future. This lets you monitor cookies without having to accept or reject the same cookies again.

The second interface is Cookie Pal's main window, which has four tabs designed for cookie management. The Cookies tab shows you which cookies are currently attached to IE and Navigator, and it lets you delete the ones you don't want. The Session screen tells you which cookies you've encountered in the current browsing session, and the Filters area lets

For many, one of the chief allures of Web browsing is the seeming anonymity of life online. But the truth is that Web browsing is hardly an anonymous activity. Behind the scenes, Web servers keep logs of the type of system and browser you're using as well as where you've come from. In some cases, they can obtain even more detailed information. Don't believe us? Point your browser to the Center for Democracy and Technology's site (www.cdt.org) and click on the Privacy Demonstration to see what kind of information can be tracked.

But there are ways to surf anonymously. One of the easiest methods is by using a service called the Anonymizer, a free service created by a graduate student at Carnegie Mellon University. Just point your browser to the Anonymizer link and then on it to "start surfing anonymously." You can also jump directly to a specific site using Anonymizer by first entering www.anonymizer.com:8080/http:// followed by the intended address in your browser's URL window. Anonymizer works with the HTTP, FTP, and Gopher protocols but currently disables JavaScript because it can bypass the service. You can also pay a subscription fee of \$15 per quarter to receive faster service.

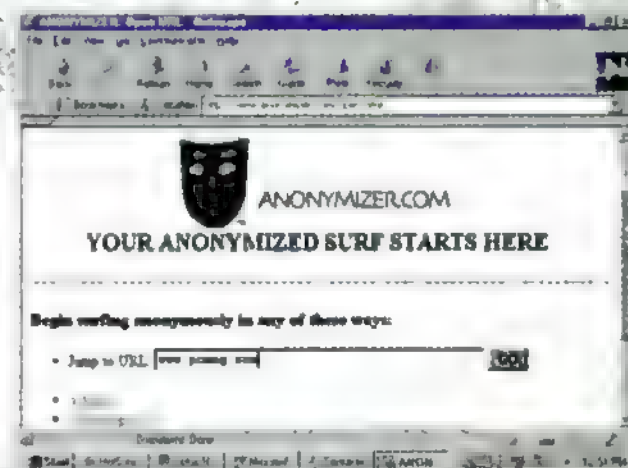
Another proxy server solution comes from Lucent Technologies. Like Anonymizer, the Lucent Personalized Web Assistant or LPWA (www.lpwa.com) is designed to act as a middleman between your browser and Web servers. However, it is designed specifically to work with sites that offer personalized information without sacrificing your privacy. To do this, the LPWA generates an alias (consisting of a user name, password, and e-mail address) for every personalized site that you visit. Only the LPWA can trace that alias to you, so once you've logged on to the LPWA server, the sites you visit never know your true identity.—NR

you specify Web servers from which you want to accept or reject all cookies. The Configure dialog lets you change text settings to accommodate non-English versions of the browsers.

The only downside to Cookie Pal is that it has to be running in the background all the time to do its job effectively, and you might notice a slight delay in system response as a result. But Version 1.1, which should be available by the time you read this, should let you configure it to run only when you open a browser. And at \$15 (or less for multiple copies), Cookie Pal is not only worth registering, it's also worth considering for your entire organization.

www.kburra.com. Circle 456 on reader service card.

Covering Your Tracks

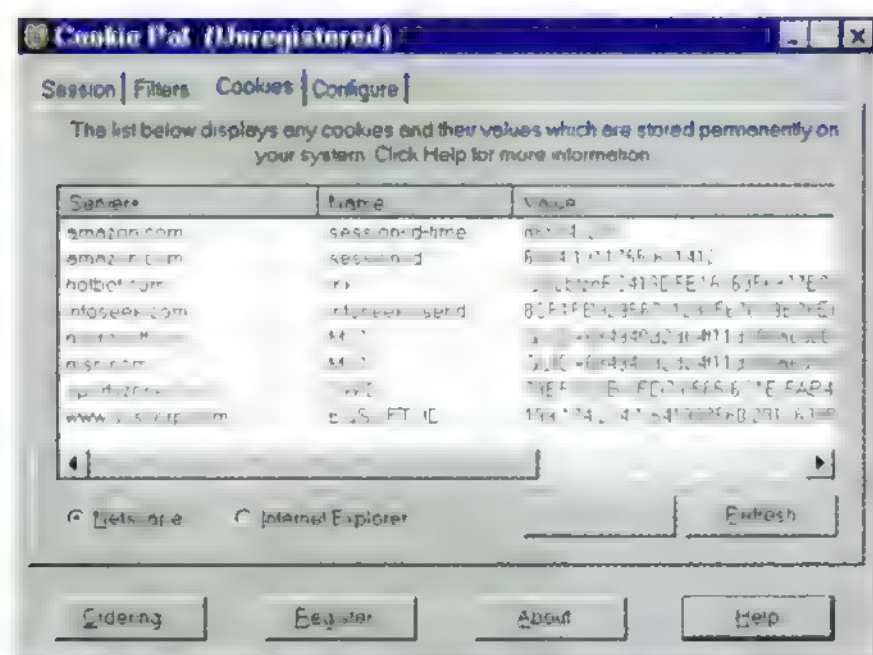


Scott McDaniel

Crumbler 97

If your main browser is Netscape Navigator and you don't want to be bothered by cookies at all, Crumbler 97 (\$10 list) might be just the utility that you've been seeking. It's an extremely simple program, but it's effective precisely because it doesn't try to do too much. Its only function, in fact, is to sit in the background and periodically blow away your Navigator cookies. At press time, Crumbler 97 did not support Microsoft Internet Explorer, but by the time you read this, it should.

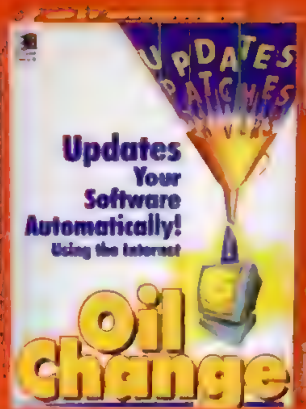
As Navigator moves from site to site, it accepts cookies and stores the information in a file called Cookies.txt. When you install Crumbler 97, you tell it where to find that file (if you installed Navigator in the default directory, the file will be at `c:\program-files\netscape\navigator`), and then you turn



Cookie Pal's main dialog box shows the cookies on your system and lets you specify cookie filters and other items.

Want to know
the easiest
way to automatically
update your PC?
Click this button!

Start



Just click the Oil Change® **Start** button and you've found the easiest way to update your software and hardware **automatically**. Oil Change locates new software updates and hardware drivers for your PC via the Internet. Simply select the updates you want and Oil Change will download and install them **automatically**. *It's that easy.* Oil Change finds everything from the latest software updates, to the newest hardware drivers; it even updates over 400 computer games.

So, why waste time trying to find, download and install updates yourself? Get Oil Change. It's the **easiest** way to update your PC.

Pick up a copy today at your local retailer, or call 1.800.841.3539 x19 to order direct.
To download a free trial copy, visit our website at www.cybermedia.com/pc1

CIRCLE 294 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink


CYBERMEDIA
MORE POWER TO YOU™

SUMMARY OF FEATURES

See www.pcmag.com for interactive views

Cookie Cutters



Products listed in alphabetical order	Complete Cleanup	Cookie Crusher	Cookie Master	Cookie Pal	Crumbler97	IEClean32	NSClean32	PGPcookie.cutter
Price	\$30 (street)	\$10.00 (list)	Free	\$15 (street)	\$10.00 (list)	\$40 (street)	\$40 (street)	\$19.95 (list)
Refuses cookies automatically	☐	☒	☐	☒	☐	☐	☐	☒
Blocks cookies from transmitting information	☐	☐	☐	☐	☐	☐	☐	☒
Can delete individual cookies	☐	☐	☒	☒	☐	☐	☐	☒
Can delete multiple cookies simultaneously	☒	☐	☒	☒	☒	☒	☒	☒
Filters specific cookie sites	☐	☐	☐	☒	☐	☐	☐	☒
Works with Microsoft Internet Explorer	☒	☒	☒	☒	☐	☒	☒	☒
Works with Netscape Navigator	☒	☒	☒	☒	☒	☐	☒	☒
Operates in the background	☐	☒	☐	☒	☐	☐	☐	☒
Works with history and cache files	☒	☐	☐	☐	☐	☒	☒	☒
Includes other security features	☐	☐	☐	☐	☐	☒	☒	☒

the utility on so that it can watch over your system. Every 45 seconds it revisits Cookies.txt and automatically deletes any cookies it finds. You can also double-click on the Crumbler 97 tray icon whenever you think you've entered a cookie-heavy site, and the program will immediately zap those that you collect.

Crumbler 97 does not allow you to delete cookies selectively; its land-mine approach can quickly become overkill, since the program may destroy cookies that you want to keep. Most users will leave the program inactive, launching it only when they want to clean out all of the cookies they've collected.

www.scscorp.com/personal/scottmac. Circle 457 on reader service card.

NSClean Privacy Software IEClean32, NSClean32

Cookies are only one part of the Internet privacy problem; other issues exist as well. For one thing, any "anonymous" FTP transaction that you perform broadcasts your user ID all over the Net. And worse still, your browser stores all kinds of information about where you've been on the Internet and what you've been doing.

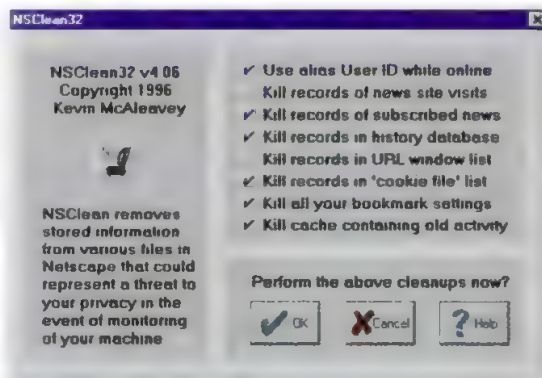
To solve the broad range of privacy and protection problems, Kevin McAleavey has designed IEClean32 (for Microsoft Internet Explorer) and NSClean32 (for Netscape Navigator). Each of the programs (\$40 street) will get rid of cookies in your browser, and more. For example, by means of the Options dialog, you can set ei-

ther program to employ an alias user name or get rid of your list of Internet Explorer favorites or Navigator bookmarks.

Both of the programs can also erase all record of your newsgroup activities, including the list of newsgroups you've visited and those to which you've subscribed. And they can delete your history database, clean out your cache files, and even clear out the URL list in the windows showing the pages you've visited. Performing these functions is always a manual activity; you can't set IEClean and NSClean to perform them automatically. Nor can you ask them to monitor these functions in the background.

Keep in mind that the programs don't let you choose which specific records in a group (such as bookmarks) to wipe out, although soon-to-be-released versions will include such a feature. Nor do they let you hide records rather than destroying them. Still, IEClean32 and NSClean32 are comprehensive solutions for covering your online tracks.

www.nsclean.com. Circle 458 on reader service card.



From NSClean32's main dialog, you can specify which types of security you want the program to perform.

Pretty Good Privacy Inc.

PGPcookie.cutter for Windows NT

An advanced utility for cookie management, PGPcookie.cutter for Windows NT (\$19.95 list) reaches the level of CookiePal, but it is not yet available for Windows 95. PGPcookie.cutter resides in Navigator's Taskbar as a small icon alongside the menu bar, blocking cookies you specify (or blocking all, by default) and letting you delete cookies you've already gathered.

The program lets you establish some cookie-pushing sites as "trusted" sites, whose cookies you know and don't need to worry about. PGPcookie.cutter's cookie-filtering mechanism lets you give the program instructions on how to handle cookies from specific sites. You can also tell it to warn you when you're sending information from your browser to a cookie-accepting site.

The program distinguishes between "blocking" and "refusing" cookies. Blocking prevents the exchange of information between your computer and a given site, but PGPcookie.cutter does collect cookies so that you can examine them. You can either delete them or transform them into accepted cookies. By contrast, refusing cookies heads them off at the pass.

The point of PGPcookie.cutter is to give you complete control over which cookies you allow, which ones you refuse outright, and which ones you collect so you can decide about them later. This is a wise approach to security.

www.gpp.com. Circle 459 on reader service card.

SPEED. EFFICIENCY. SECURITY.

IT'S GOOD TO HAVE THE RIGHT CONNECTIONS.

DIRECT CONNECT

Fast and efficient access to the Internet with in-house experts managing your connectivity.



Features include router configuration and support, Premium Plus support with the NETCOM Operations Center (NOC), on-line usage statistics, and options such as Automatic Reconnect and High-Performance Routing.

SECURE CONNECT

Protect your virtual network between specific sites.



Features include security Needs Assessment, strategy development, maintenance and configuration of security applications.

SITE CONNECT

Connect your website to the Internet so your customers can reach you.



Features include high speed Internet access, additional domain names and IP addresses, Premium Plus NOC support and options such as Automatic Reconnect and High-Performance Routing.

As you already know, the quality of your business' Internet connectivity can have a lot to do with the success of your business. ▼ But you may not know that NETCOM offers full-service connectivity solutions with a network backbone providing 99.9% availability. That shouldn't be surprising, though, when you realize that the Internet business is our only business. And the only Internet connection you'll ever need. ▼

**WE PUT THE
NET TO WORK
FOR YOU.**



www.netcom.com

Visit our site or call now
to find out about our
business connectivity solutions

1-888-440-6917



NETCOM®

COMMUNICATE!

All-in-One Fax, Voice, Data, E-mail and Contact Management Software



AnyWay • AnyOne • AnyWhere

COMMUNICATE! is a completely integrated Fax, Voice/Telephony, E-mail and Data Communications software package for Windows. It seamlessly integrates a Contact Manager, Graphics Editor and OCR capabilities under one program icon while using a very familiar telephone/answering machine interface. COMMUNICATE! is the most comprehensive and easy-to-use communications software package available for small business, home office and mobile users.

COMMUNICATE! is as simple to install as 'point and click' and works on any Windows-based PC.

All-in-One Software

- Fax** Send, receive, broadcast and fax-on-demand
- Voice** Fully featured voice mail system with broadcast capability
- Data** Connect to a BBS, and transfer files with other systems
- E-mail** Send, receive and broadcast Internet e-mail
- OCR** Convert fax images to text
- Contact Management** Powerful database searches and unlimited address books

Available for
Windows NT, 95
and 3.11



POINT

-  **COMMUNICATE!™**
-  **Send a fax!**
-  **Check your phone messages!**
-  **Send Internet e-mail!**
-  **Manage your contact list!**



Toll Free: 1-800-668-2185 • Tel: 1-905-795-2888 • Fax: 1-905-795-0101 • Internet: <http://www.01com.com>



CIRCLE 134 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink



Secure E-Mail

By Sheryl Canter

Today's broad-scale use of e-mail demands a universal, nonproprietary solution that will work with any e-mail client. The S/MIME (or Secure MIME) specification was written to address this growing need.

No one denies that S/MIME is needed, and its adoption by the key players, Microsoft and Netscape, makes it the undisputed winner among the competing standards. But the S/MIME standard and implementations of it we tested still need work. Each of the six S/MIME e-mail clients, including Deming's WorldSecure Client (the reference implementation), had at least one major flaw.

S/MIME uses encryption technology to protect against three types of security violations: snooping, tampering, and forgery. It protects against snooping by encrypting

the message with a *symmetric cipher*, an algorithm that uses the same key for encryption and decryption. Every S/MIME program must support, at least, the 40-bit RC2 symmetric cipher—the maximum key length permitted for export by the U.S. government. S/MIME programs can use stronger ciphers as well, but no program yet implements a way to negotiate a mutually understood algorithm.

The symmetric key must be transmitted with the message or the recipient won't be able to read it, but the key itself must be encoded or everyone will be able to read it. The symmetric key is encrypted

using *dual-key* or *asymmetric* encryption. This involves the use of a public and private key pair, and every person using S/MIME must have one. The sender uses the public key of the recipient to encrypt the symmetric key, and the recipient uses the private key to decrypt it. The two keys are mathematically related, but the private key cannot be derived from the public key.

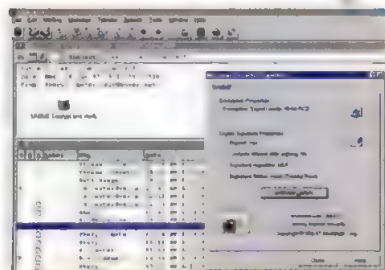
S/MIME uses *digital signatures* (encryption with a private key) to protect against both tampering and forgery. First the message text is condensed, using a *hash algorithm*, into a unique digest analogous to a checksum. S/MIME recommends the SHA-1 algorithm. The digest is then encrypted with the sender's private key, and this signature is sent with the message.

The recipient's e-mail program attempts to decrypt the hash with the sender's public key, which is also sent along with the message. If it works, then the message has not been forged. The recipient's e-mail program then decrypts the message, using the recipient's private key, and computes the digest. If the computed digest matches the digest transmitted with the message, then no tampering took place.

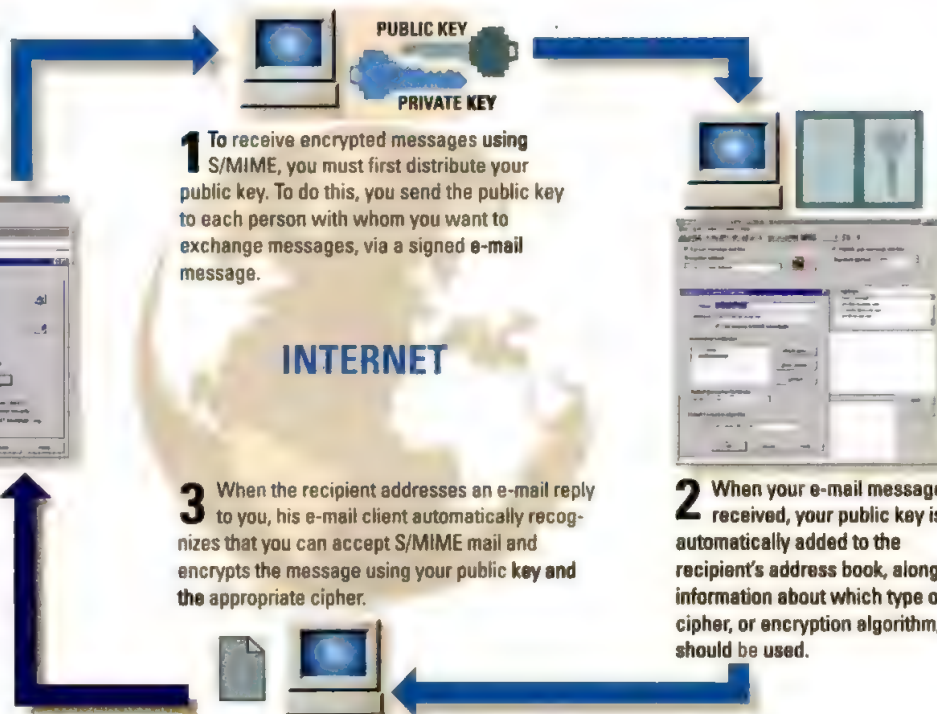
The final piece of S/MIME is the trust

Sending E-Mail Securely

When it works properly, S/MIME should be nearly invisible to the end user. Behind the scenes, however, a lot goes on to ensure that your messages arrive safely. The S/MIME protocol is based on public-key encryption, also known as asymmetric encryption. This process involves two keys.



4 When you receive the message, your e-mail client automatically decrypts it (or prompts you to decrypt it) using your private key. The public and private keys are mathematically related, but the private key cannot be derived from the public key.



hierarchy. This is a method based on *certificates* for verifying that people really are who they say they are. A certificate is a public key signed with the private key of a trusted third party such as Verisign. Because of the importance of the trust hierarchy, S/MIME products should include a certificate management system that lets you set trust levels, but not all do.

Some products also don't recognize each other's digital signatures, or they don't default to encryption algorithms that other clients do not support. Some lack the ability to obtain full-featured Verisign certificates or, more seriously, lack the ability to import and export private keys for use with other e-mail clients or computers such as notebooks. Also, many products, including Netscape Messenger, come with problems. The details are in the reviews that follow. The promise of S/MIME—interoperable e-mail security—is tantalizing but hasn't quite reached its potential yet.

Frontier Technologies Corp.

e-Mail

The e-mail component of the e-Lock family of products from Frontier Technologies Corp., e-Mail 1.0 (\$49 list) combines a user-friendly design with good online help. It does not maintain a certificate database, so you can't set trust levels for certificate authorities, and if a signer's security is compromised, you can't reject all keys signed by it.

Information on users' public keys and the type of encryption to use when sending to them is stored in the address book. The product does not automatically

Editors' Choice

• WorldSecure Client



The need for an easy, interoperable way to secure e-mail

communications has become obvious. But S/MIME, the industry-accepted standard, is still in flux.

Of the six products we tested, Deming Internet Security's well-designed WorldSecure Client offers the best S/MIME implementation and all the features needed for secure e-mail. The

snatch this information from the messages you receive, though. And e-Mail supports only the MD2 and MD5 hash algorithms. The S/MIME specification recommends that SHA-1 be used for sending. But e-Mail doesn't currently support SHA-1, and though it claims to be S/MIME-compliant, at present it cannot read the signatures of most other e-mail clients.

Because of its logical organization, its good documentation, and the strength of the products in the e-Lock family, e-Mail has potential. But since it does not support the SHA-1 hash algorithm and lacks a certificate authority database, it's not ready for prime time yet.

e-Mail 1.0. List price: \$49. Requires: 486-based PC or better, 8MB RAM, 1MB hard disk space, Microsoft Windows 95 or NT

standalone version works through MAPI, and WorldSecure is also available as a plug-in for Microsoft Windows Messaging and Qualcomm's Eudora Pro 3.0.

OpenSoft's ExpressMail, a standalone e-mail client, is a contender by virtue of its powerful feature set, but its interface is anything but intuitive. Netscape Messenger has the largest installed base of any product in this story, but it suffers from first-release design flaws and bugs.

The landscape is changing quickly, however. At press time, Microsoft was working on S/MIME support for Outlook Express, and updates for existing products are in the works.

4.0. Frontier Technologies Corp., Mequon, WI; 800-929-3054; www.frontiertech.com. Circle 460 on reader service card.

ConnectSoft Inc.

E-Mail Connection

The only product in this roundup that wasn't developed specifically to support S/MIME, E-Mail Connection 3.1a (\$49.95 list) is a cross-service e-mail client to which S/MIME support was added, and that grafting-on shows.

The S/MIME implementation in E-Mail Connection is primitive and inadequate. For example, the product doesn't come with a database for storing certificate signers or a place in the address book to store the type of encryption that a recipient can decode. And you cannot limit passphrase prompting to first use; the product prompts you every time you use your private key.

E-Mail Connection marks both signed and encrypted messages with a small padlock icon. Before decoding, the lock is closed; afterwards, it's open. Since the locked icon has three possible meanings (signed, encrypted, or both), you can't tell exactly how the message arrived. And you also can't tell what hash algorithm or encryption algorithm was used to send it.

Like Frontier Technologies Corp.'s e-Mail, E-Mail Connection's lack of a certificate database means you can't set trust levels for signers. Certificates received in e-mail are automatically added to the address book, and there is no way to indicate the trust level. Since you can't evaluate the

PERFORMANCE TESTS

S/MIME Interoperability

We tested S/MIME e-mail clients using Deming Internet Security's WorldSecure Client, which is the reference implementation used by RSA to certify products for S/MIME compliance. To determine interoperability, we tried to send and receive signatures using SHA-1, and also to send

and receive encrypted messages using the RC2 40-bit algorithm. Our interoperability tests demonstrated that the promise of S/MIME is far from reality. Of the five e-mail clients we tested (not including WorldSecure Client), only ConnectSoft's E-Mail Connection passed the tests.

Reference Implementation: WorldSecure Client

✓ PASS ✗ FAIL	e-Mail	E-Mail Connection	ExpressMail	MailSecure	Netscape Messenger
Signatures (SHA-1): send/receive	✗ ✗	✓ ✓	✓ ✓	✗ ✗	✗ ✓
Encryption (RC2 40-bit): send/receive	N/A	✓ ✓	✓ ✗	N/A	✓ ✗

* Netscape Messenger cannot handle self-signed certificates.

N/A—Not applicable. We could not test encryption because the product failed to send or receive signatures.



You would too, if you were an energy-saving monitor that could boast the lowest defect rates in the industry while performing brilliantly over the long haul of many of the supposedly reliable brands you may have found yourself attracted to but that in reality could never offer all those dollar-connected things you corporate types like to scrutinize including minuscule down time, virtually non-existent out of the box failures and brain-dead quick and easy set-up, a particularly invaluable feature often overlooked by many well-meaning but often evasive sale reps even though going without it means you'll be bogged down with unforeseen manpower costs not to mention that set-up problems just kind of take the fun out of buying a new monitor that may or may not share our monitor's complete compatibility with Windows 95 Plug and Play and Windows NT 4.0 or perform nearly as well as an award-winning EIZO, the company that also gives you as good a warranty and technical support package as you're apt to find anywhere. Geez. We could say a lot more but by now you surely get our point, so we'll wrap up

by telling you that EIZO is the universal
brand name of Nanao.

And that you can reach us at 800-800-5202 or on
the world wide web at www.eizo.com. Reliably.

**OBVIOUSLY,
EIZO MONITORS HAVE A LOT TO SAY
ABOUT RELIABILITY.**



After leading the industry year after year,
what is it we're trying to prove?



We mean business.



**Introducing the new Toshiba Tecra.
The ultimate portable for corporate America.**

If there's one thing we know how to do well, it's raising portable industry standards to new levels. Something we couldn't do without the constant challenge of not only meeting your needs, but surpassing them. Introducing the Tecra™ 530CDT. A portable packed with the perfect balance of performance, portability and expandability. Delivering a high-resolution TFT display, large storage capacity and a 166MHz Intel Pentium® processor with MMX™ technology. All wrapped up in a sleek new design. The Tecra 530CDT. Experience the portable that will take the business world into the next millennium. When you do, you'll find yourself in a place where staying ahead of the game is a way of life. With one clear intention. **Always Lead.™**



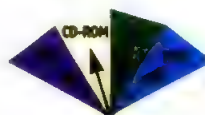
NEW DESIGN

New tooling to deliver high-end features in a durable, sleeker notebook.



ULTIMATE PERFORMANCE

Experience accelerated multimedia applications with MMX™ technology, 32-bit PCI architecture and 32MB of memory, standard.



CUSTOMIZED CONFIGURATION

With the SelectBay™ configure your system to meet your needs. Swap out your 10X* CD-ROM with a floppy disk drive, optional second 2GB hard drive or optional second Lithium Ion battery.



EXPANDABILITY

With our one-touch hot docking solution, you get additional slots for PC Cards, PCI and ISA Cards and stereo speakers.

Tecra 530CDT/520CDT

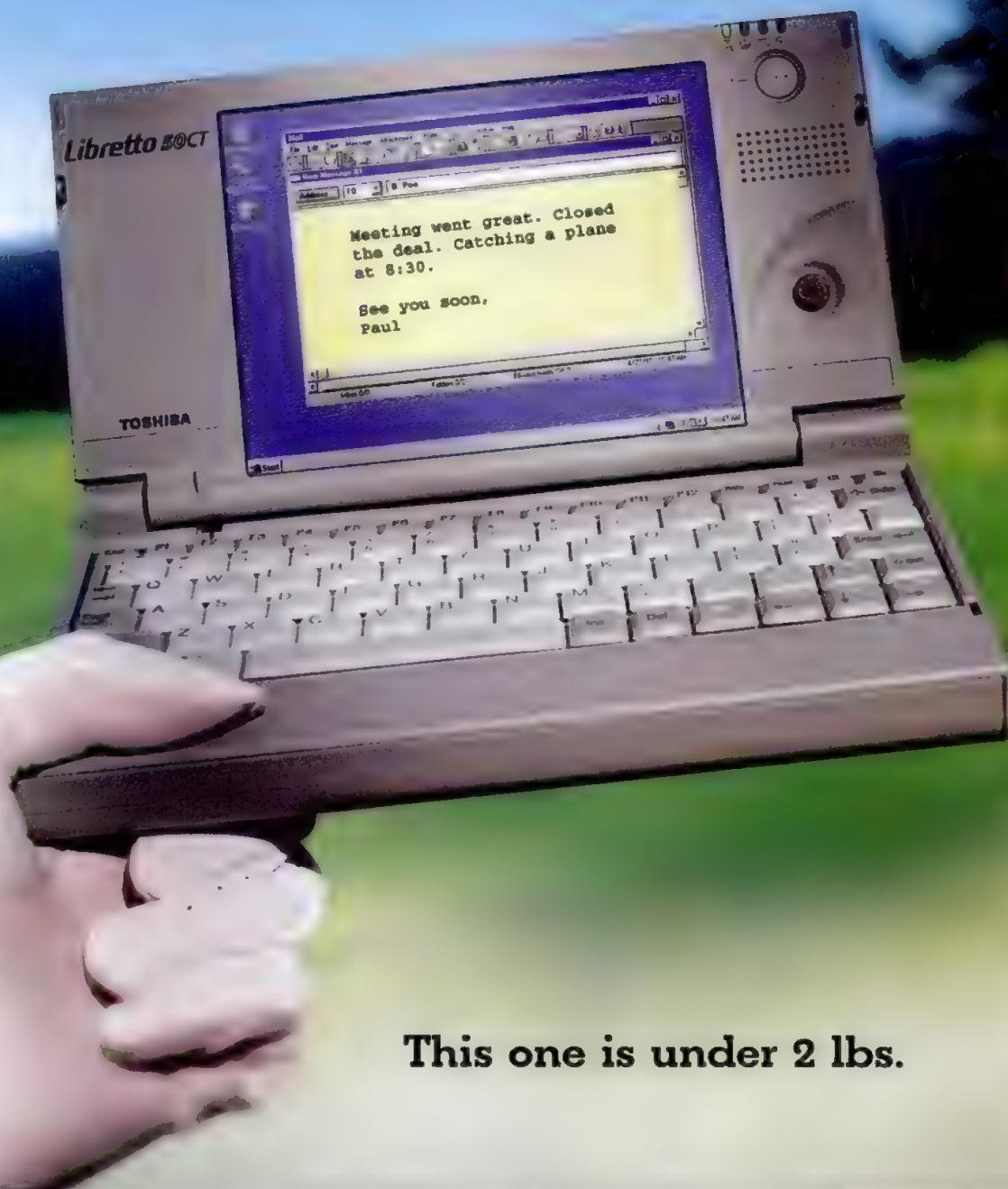
- 12.1" dia. active-matrix TFT color display
- 1024 x 768 resolution (530CDT)
- 800 x 600 resolution (520CDT)
- 166MHz Pentium® processor with MMX™ technology, 256KB L2 cache
- PCI system-bus architecture
- 2.1 billion byte (=2.0GB) removable HDD
- 32MB high-speed EDO DRAM (expandable to 160MB)
- SelectBay™ supports CD-ROM, floppy disk drive, optional second hard drive or optional second Lithium Ion battery
- Modular 10X* CD-ROM
- HiQVideo™ PCI graphics controller with 2MB video memory (4Mbit EDO RAM)
- Universal Serial Bus (USB) port
- MPEG playback through either software or optional ZV Card
- 16-bit MIDI, WAV and Sound Blaster® Pro compatible with stereo speakers and microphone
- Supports two Type II or one Type III 16-bit PC Cards, ZV Cards or 32-bit CardBus Cards
- Built-in cellular-ready 33.6Kbps, V.34 voice/data/fax modem
- Fast Infrared (FIR) IrDA compliant port
- Lithium Ion battery
- Optional Desk Station V Plus docking station or NoteDock™ II Enhanced Port Replicator
- Windows® 95
- 3-year limited warranty
- Toll-free technical support 7 days a week, 24 hours a day

For more information, visit <http://computers.toshiba.com>, or call 1-800-457-7777.

In Touch with Tomorrow
TOSHIBA

CIRCLE 377 ON READER SERVICE CARD

**As the industry leader, we're used to
making big announcements.**



This one is under 2 lbs.

Introducing the new Libretto.
The 1.85 lb. phenomenon.

Don't let the size fool you. What you're looking at is the innovation that will set the highest of industry standards in the tiniest of places. Capable of running Windows® 95, yet compact and light enough to fit in the palm of your hand. There is no other computer like it. Introducing the Libretto® 50CT. The first portable of its kind. A mini-notebook that allows you to access e-mail, work on spreadsheets or even update your handicap from just about any fairway. So light and small it's the perfect communication and information manager. With the Libretto you'll definitely improve your game. And everything we do is designed to provide you with the tools to do just that. After all, we share a simple philosophy. **Always Lead.™**



SIZE AND WEIGHT

At 8.3" x 4.5" x 1.3" and only 1.85 lbs., the Libretto is so small and light it's the perfect companion.



pentium

PENTIUM® PROCESSOR

A powerful Pentium® processor delivers all the performance you need.



CONNECTIVITY

With the PC card slot you can stay connected with a modem and hook up to a floppy disk drive or CD-ROM. Experience wireless connectivity with built-in infrared capabilities.

Designed for



WINDOWS 95 PERFORMANCE

The only mini-notebook to run Windows 95

LIBRETTO 50CT

- 6.1" dia. active-matrix TFT color display, 640 x 480 resolution
- 75MHz (2.9V) Pentium® processor, 16KB internal cache
- 810 million byte (~772MB) HDD
- 16MB EDO DRAM (expandable to 32MB)
- Built-in 16-bit audio with internal speaker
- External floppy disk drive
- One Type II PC Card slot supports modem, floppy disk drive or optional CD-ROM drive
- Lithium Ion battery
- Serial Infrared IrDA compliant port
- Libretto Accupoint® pointing device
- Optional Enhanced Port Replicator or optional Port Expander
- 1.85 lbs.
- 8.3" x 4.5" x 1.3"
- Windows 95 standard
- 1 year limited warranty
- Toll-free technical support - 7 days a week, 24 hours a day

For more information, visit <http://computers.toshiba.com>, or call 1-800-457-7777.

In Touch with Tomorrow
TOSHIBA

CIRCLE 378 ON READER SERVICE CARD

Yours Truly, Anonymous

S/MIME offers security to e-mail recipients by providing a way to verify the sender's identity. But what if the sender prefers to remain anonymous? *Anonymous remailers* let you send e-mail and post messages to newsgroups without revealing your identity.

Basically, anonymous remailers are free services that strip off identifying header information before sending a message on its way. You send your message via the remailer, and the remailer takes care of the rest.

There are two types of anonymous remailers: pseudo-anonymous and anonymous. Pseudo-anonymous remailers involve just one "hop," one extra stop between you (the sender) and the recipient. While easier to use, pseudo-anonymous remailers rely on the integrity of the remailer operator, who knows both your identity and the recipient's identity. The operator could be forced by court order to reveal your identity.

Truly anonymous remailers fall into two categories: Cypherpunk remailers and Mixmaster remailers, the latter being more secure. Both use two or more hops between the source and the final destination. This greatly improves security since the operator at the first hop does not know the destination, and the operator at the last hop does not know the source. Mixmaster remailers further prevent monitoring by parsing all messages into packets of equal size, which are reassembled at the final hop before going on to their final destination.

As Internet e-mail grows in popularity, users will demand these types of privacy measures. You can find a list of remailers and the features they offer at www.cs.berkeley.edu/~raph/remailer-list.html.—SC

source of your message, a fundamental feature of S/MIME is omitted. Also, you are limited unrealistically to one certificate for each person across all e-mail addresses.

E-Mail Connection is a capable general-purpose e-mail client, and it passed all of our interoperability tests, but its S/MIME implementation is limited.

E-Mail Connection 3.1a. List price: \$49.95. Requires: 486-based PC or better, 4MB RAM, 16MB hard disk space, Microsoft Windows 3.1 or later. ConnectSoft Inc., Bellevue, WA; 800-889-3499, 206-827-6467; fax, 206-489-3446; www.connectsoft.com. *Circle 461 on reader service card.*

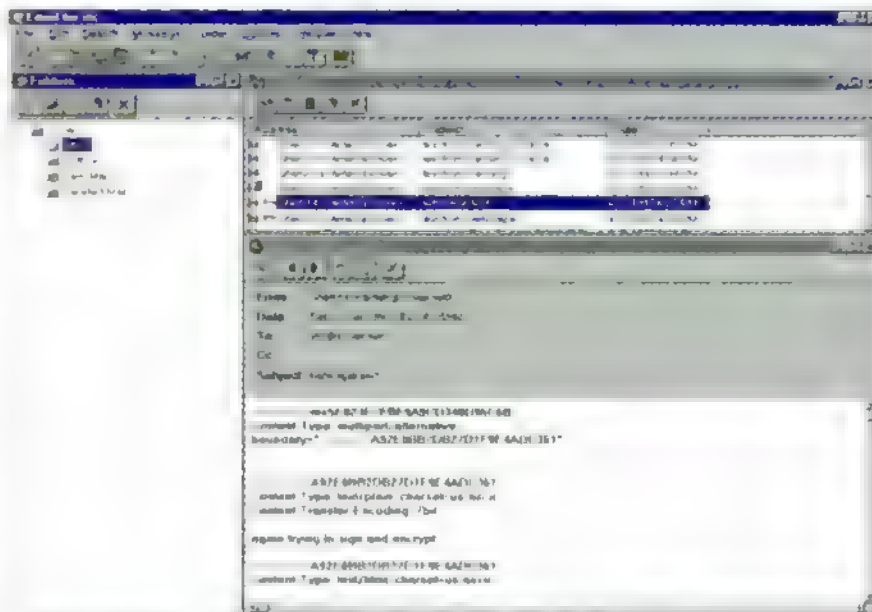
OpenSoft Corp. ExpressMail

A standalone S/MIME e-mail client, OpenSoft Corp.'s ExpressMail 2.0 offers some enhancements, notably LDAP support. But ExpressMail 2.0's enhanced feature set and high degree of configurability are offset somewhat by an awkward and nonintuitive interface.

If you want to obtain a certificate signed by Verisign for use with ExpressMail (\$49 list), be careful not to make any mistakes in your request, and it is advisable to back up

your private key. This is because you only get one chance—although OpenSoft claims that you can call Verisign or go to its Web site to revoke your mistake.

To its detriment, ExpressMail is the only product we reviewed that doesn't let you configure it to require a passphrase each time you access your private key. The product does use a passphrase to grant access to your address book (where the key is stored) when you first launch the program, but not afterwards. Thus you must exit the program when you're away from your desk to ensure security.



ExpressMail 2.0 uses different icons to give at-a-glance information about properties of received messages.

If you need its unique features, ExpressMail is worth the extra effort required to learn how to use it. Otherwise, you'll be better off with an easier-to-use product. **ExpressMail 2.0.** List price: \$49. Requires: 486-based PC or better, 8MB RAM, 10MB hard disk space, Microsoft Windows 3.1 or NT 3.51 or later. OpenSoft Corp., Los Angeles; 800-996-6736, 212-249-5806; www.opensoft.com. *Circle 462 on reader service card.*

Baltimore Technologies MailSecure

MailSecure 1.0 (\$80 street) is an S/MIME plug-in for Windows Messaging clients such as the Windows 95 Inbox. We reviewed a buggy public beta release; at press time, Baltimore Technologies was planning to release Version 1.1, which should address some of the bugs we found.

MailSecure is supposed to add certificates it receives from incoming messages to its certificate manager automatically. However, it does not recognize signatures from other e-mail clients, so nothing is ever added to the database. And as you can't obtain anyone else's public key, you can't send encrypted messages. Also, MailSecure's own certificates have a flaw that causes a crash in WorldSecure Client, the S/MIME reference implementation.

MailSecure prompts you for the information it needs to create the public/private key pair when you first install it. You can self-sign the certificate, or you can send it to Baltimore Technologies for signing. You cannot obtain a certificate from Verisign or another recognized certificate authority.

The program adds four icons to the message edit window, two at the far left and two at the far right. Each pair consists of an encryption icon and a signing icon. The left-hand pair controls the default options. The right-hand pair should override the defaults for the current message, but this didn't work properly. All in all, until MailSecure performs more reliably, you'll find other products offer a better S/MIME solution.

MailSecure 1.0. Street price: \$80. Requires: 486-based PC or later, 8MB RAM, 1MB hard disk space, Microsoft Windows 95 or NT 3.51 or later. Baltimore



**You were expecting a new version.
But you weren't expecting this.**
www.microsoft.com/ie4/preview/

Where do you want to go today?

www.microsoft.com/ie/

Microsoft

SUMMARY OF FEATURES

See www.pcmag.com for interactive views

S/MIME E-Mail

PC MAGAZINE
EDITORS' CHOICE

■ YES ■ NO □ OPTIONAL

Products listed in alphabetical order

Price	e-Mail 1.0	E-Mail Connection 3.1a	ExpressMail 2.0	MailSecure 1.0	Netscape Messenger	WorldSecure Client
	\$49.00 (list)	\$49.95 (list)	\$49.00 (list)	\$80 (street)	Standard Edition, \$59.00 (list)	\$89.95 (list)
Standalone client/Windows Messaging plug-in/Eudora plug-in	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Symmetric ciphers supported in addition to RC2 40-bit	DES, RC2 (128)	DES (56), RC2 (128)	DES (56), RC2 (64, 128, 255), Triple-DES (112)	RC2 (64, 128), Triple-DES (112)	DES (56), RC2 (64, 128), Triple-DES (168)	DES (56), RC2 (64, 128, 255), Triple-DES (112)
Supports 512-/768-bit dual key lengths	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Supports 1,024-/2,048-bit dual key lengths	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Supports hashes for sending MD2/MD5/SHA1	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Supports hashes for receiving MD2/MD5/SHA1	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Allows creation of self-signed certificates	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Supports free/paid Verisign certificates	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Saves public keys/certificates from signed mail automatically	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
LDAP support for obtaining/submitting public keys	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Database for storing certificate-authority certificates	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Can import new certificate authorities into database/assign trust levels	N/A	N/A	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Password prompting: always/first time/after time lapse	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■

N/A—Not applicable: The product does not have this feature.

Note: All answers refer to the domestic versions. Export versions may offer different features.

Technologies, Dublin, Ireland; (353) 1-605-4399; www.baltimore.ie. Circle 463 on reader service card.

Netscape Communications Corp. Netscape Messenger

The e-mail component of Netscape Communicator 4.0 (\$59 Standard Edition), Netscape Messenger, is one of the first S/MIME products with support for LDAP directories of public keys. You can look up the public keys of intended recipients or submit your own to one of the online databases. But you must have a person's public key to send an encrypted message.

Click on the Security button for one-stop access to all the product's security features. When you receive a signed message, Messenger automatically adds the public key to your People list. But Netscape doesn't recognize self-signed certificates and doesn't add the signer to the list, so you can't tell Messenger to accept these certificates. Netscape has promised to fix the problem in a later release.

A more serious problem is that Messenger allows only one certificate per e-mail ID. When a new certificate is sent with a message, it replaces the old one without warning in the People list. The user has no protection against spoofed certificates.

Because Messenger has an associated browser that can communicate securely, it has the ability to obtain full-featured paid keys from Verisign. Messenger is a good general-purpose e-mail client, but its S/MIME implementation has serious de-

sign flaws and is not interoperable.

Netscape Communicator 4.0. List price: Standard Edition, \$59; Professional Edition, \$79. Requires: 486-based PC or better, 8MB RAM, 13MB hard disk space, Microsoft Windows 3.1 or NT 3.51 or later. Netscape Communications Corp., Mountain View, CA; 800-638-7483, 415-254-1900; home.netscape.com. Circle 464 on reader service card.

Deming Internet Security WorldSecure Client



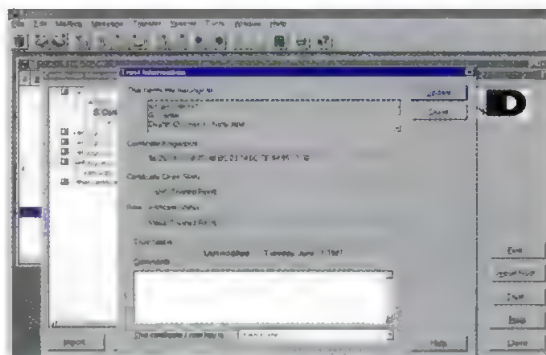
WorldSecure Client (\$89.95 list), formerly known as Secure Messenger, is the designated reference implementation for the RSA-sponsored S/MIME interoperability tests. A new dialog, Certificate Sources, lets you specify the LDAP servers to use for searching and publishing certificates. For searching, you use the

new Find button on the Certificate Manager dialog; for publishing, you use the new Publish button on the S/MIME keys page of the Security Settings dialog.

Secure Messenger is available as a plug-in for Microsoft Windows Messaging, as a plug-in for Qualcomm's Eudora Pro 3.0, and as a standalone program that communicates with MAPI clients and that you can use to sign and encrypt files. All give menu access to the dialogs entitled User Configuration, Security Settings, Certificate Manager, Certificate Sources, and Address Book. The Windows Messaging and Eudora plug-ins add encryption and signature buttons to the message-edit window.

Certificate Manager uses a tree to display the certificates you've collected. Address Book lets you note whether a recipient can receive S/MIME messages and what type of symmetric cipher to use for encrypted messages. You can store multiple certificates per person and select which to use for encrypting.

All in all, WorldSecure Client is easy to use and has a well-thought-out feature set. **WorldSecure Client.** List price: \$89.95. Requires: 386-based PC or better, 16MB RAM, 1MB hard disk space, Microsoft Windows 3.1 or NT 3.51 or later. Deming Internet Security, Santa Clara, CA; 800-454-4674, 408-567-1500; www.worldtalk.com. Circle 465 on reader service card. □



The Trust Information dialog in WorldSecure Client's Certificate Manager lets you set the trust level for each certificate.

How about a little expert advice...

"...best turnkey solution for linking your IPX-based network to the Internet..."



PC Magazine, Jan. 7, 1997
Best of Year Award

"...extremely flexible and surprisingly easy to configure..."

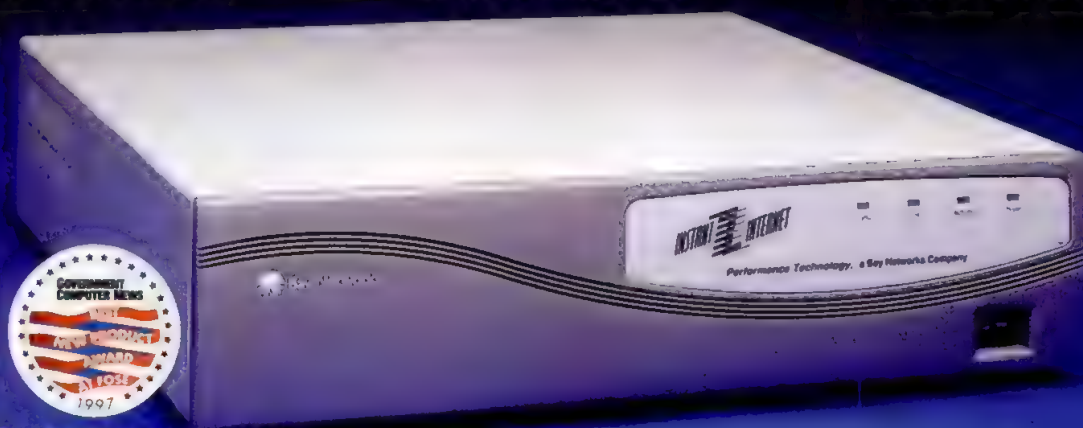


Network Computing, Sept. 15, 1996
Editor's Choice Award

"...easy installation, superior management features, and good performance..."



PC Magazine, Nov. 19, 1996
Editors' Choice Award



Government Computer News, 1997
Best New Product Award

Instant Internet™ is the only way to connect your LAN to the Internet.

Instant Internet has won the industry's highest honors. Why? Because Instant Internet works. Administrators stay in complete control of their networks while giving users full access to the Internet's powerful communications and information resources.

Essential Management Features:

Instant Internet maintains control of employee productivity by providing Network Administrators

easy-to-use tools that manage where and when users may access the Internet. Logging features also show everywhere users went and how long they stayed there.

Easy Installation: Installation is simple. Plug Instant Internet into your LAN. Plug it into your outside line. Turn it on. Nothing to reboot. Any questions? Valuable NDS and Bindery information is even imported...nothing to re-key.

Safe and Secure: Because Instant Internet exceeds FIREWALL specifications, LAN Administrators can sleep soundly at night. LANs are completely protected from hackers because there is no need to load TCP/IP anywhere on your LAN.

Gee, no wonder they like it.



Bay Networks

Call today for your free information booklet on

**Connecting Your LAN
to the Internet**

Instant Internet—The Experts' Choice

(800) 784-4638

www.instant.net

NOW THAT MS EXCHANGE DELIVERS ALL THOSE E-MAIL ATTACHMENTS, GUARANTEE ACCESS WITH QUICK VIEW PLUS.



Microsoft® Exchange now delivers real enterprise-wide communication. But there is more to communication than just delivery. You need **Quick View Plus®**, the universal file viewer from Inso, to guarantee you can actually access file attachments across virtually all formats and versions.

When you add the power of Quick View Plus to Exchange, there's no worry about file compatibility. With a simple mouse click, anyone can open, view, print, copy, or paste files in over 250 formats



— even without the source applications. So documents created in all your different applications, even operating systems, become universally accessible. From word processing and spreadsheets to databases, presentations and graphics.

Seeing is believing. For information about volume licensing, or a free copy of our white paper, please contact Inso at **1-888-271-4676**, ext. 245 or www.inso.com/qvp.



FOR SINGLE COPY SALES,
CALL TO FIND THE RETAILER NEAREST YOU.

Inso®

1-888-271-4676, ext. 245
www.inso.com/qvp

Burns CDs in her kitchen.

ComputerLife

FIND OUT WHAT YOU CAN DO.

To subscribe, call 1-800-926-1578 or visit <http://www.zdnet.com/~comlife/>



Two weeks ago,
I heard of **Adobe PageMill**.
Today, **the whole world**
has heard about me.

"I never dreamed
taking my business
worldwide could
happen so quickly."



Let the whole world hear about your business, too. It's easy to build your business on-line with Adobe® PageMill™ software.

Just drag and drop text and images into place, and watch your Web pages take shape before your eyes.

You don't have to know HTML to get that professional look. ☺ And for a limited time, Adobe PageMill also comes with Adobe Photoshop® LE – plus Bonus Web Content with more than 1,000 ready-to-use images, sounds, animations, and more. All for just \$99 – Windows® or Macintosh. Don't wait another minute to start building your business on the Web. Call us at 1-800-411-8657, extension 32801

or visit our Website at www.adobe.com/special/pagemill/smbusiness/



If you can *dream* it, you can *do* it.*

Adobe PageMill *The fastest, easiest way to get your business on the Web.*

©1997 Adobe Systems Incorporated. Adobe, the Adobe logo, PageMill, the PageMill logo, Photoshop, and "If you can dream it, you can do it" are trademarks of Adobe Systems Incorporated. Windows is either a trademark or a registered trademark of Microsoft Corporation. Macintosh is a trademark of Apple Computer, Inc., registered in the U.S. and other countries.

CIRCLE 250 ON READER SERVICE CARD

Chat Software

Talk of the Internet

Interact with others and build online communities with the latest Internet chat software.

By *Heath H. Herel*

Internet chat has entered a new realm, taking real-time communication beyond the traditional world of Internet relay chat (IRC). Today, chat packages range from simple text-based chat to entire virtual chat worlds. Chat's real-time nature gives it the unique ability to foster a true sense of community, more so than any other Internet application. Chat is an essential component of many commercial Web sites and can be an effective, inexpensive tool to enable far-flung workgroups to communicate easily. With the advent of Java-based and graphical clients, Internet chat packages have matured into compelling applications for Web sites, giving visitors a fun way to connect with each other.

We looked at seven chat packages in this roundup: Magma Chat Server, E-Pub Chat, eShare Expressions, ichat Rooms 3.0, The Palace Software, Virtual Places, and VolanoChat. We tested each product's client and server offerings, and we considered each product's viability for both commercial and productivity applications. While we tested only servers that run under Microsoft Windows NT 4.0, many work with other operating systems, including Windows 95, MacOS, and multiple flavors of Unix.



IN THIS REVIEW

Chat Server 1.59d	182	Virtual Places 2.1	192
E-Pub Chat 1.01	183	VolanoChat 1.1	195
eShare Expressions 1.1	186	Editors' Choice	183
The Palace 1.1	188	One-on-One Chat in an Instant	188
Rooms 3.0	191	Virtually at Work	192

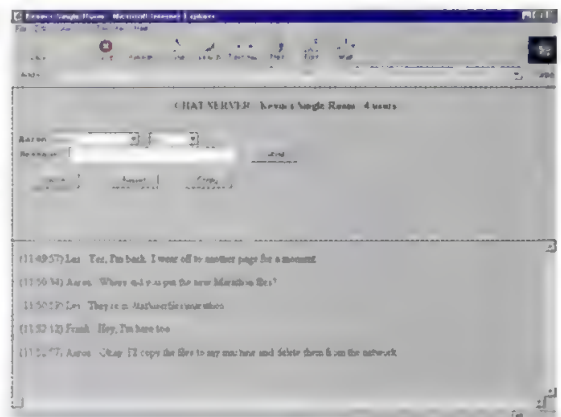
A LOT TO TALK ABOUT

If you want more than just chat, then you'll be delighted with this newest crop of chat products, which move well beyond the typical "chat room" metaphor. We were able to set up tours of the Web with products such as Rooms and Virtual

Places, taking a group of chatters on a game of Internet Follow the Leader while maintaining a conversation throughout.

We also could set up online events, hosting a live, moderated Q&A session. If it's graphics you are after, then you'll be blown away by The Palace and Virtual Places. Each program's detailed graphical approach places you in an entirely different world. Rooms goes as far as letting you host chat in a VRML 3-D environment. E-Pub Chat, The Palace, Rooms, and Virtual Places all offer avatar-based chat, where you can represent yourself graphically to others while you chat. This approach may not be best suited for a workgroup productivity tool but is quickly becoming the standard for commercial Web sites.

None of the packages we tested was particularly difficult to set up or administer, and a typical Webmaster should have little trouble getting started when implementing chat. Chat Server and VolanoChat both require actions from a command prompt, making them less intuitive than their GUI cousins. E-Pub Chat and Rooms provide very intuitive tools for designing your rooms, eliminating much of the grunt work involved in the design process. Ultimately, a user's interest in chat on a public Web site will depend on the level of discourse going on there. But you can give visitors to your site a reason to come back with a fun, flexible environment. Chat is not for all sites or all users, but with the powerful tools that are now available, it is gaining momentum as a mainstream means for real-time communication. Read on—surely one of these packages will give you something to chat about.



Magma's Chat Server provides basic chat well, but it is generally a no-frills environment.

Magma Communications Ltd.

Chat Server

A viable product for implementing basic chat on a Web site, Magma Communications' Chat Server 1.59d (about \$1,550 USD, list) offers many of the same features as the other products in our roundup, such as customizable multiple chat rooms, a Java client, and members-only access. But Chat Server cannot compare to its competitors in its ease of use, requiring you to

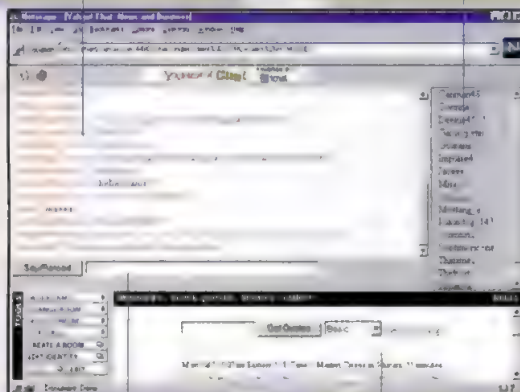
The Changing Face of Chat

We've come a long way since IRC Chat. You can now chat in a much more friendly environment with HTML and Java chat.

HTML-based chat. Users connect to the Web server running proprietary chat server software with a browser, through HTTP. Messages are then sent by the chat server software to each connected chat client, also via HTTP.

This is a chat room. The text scrolls by when you hit Enter

All the users in the room are listed in a side panel

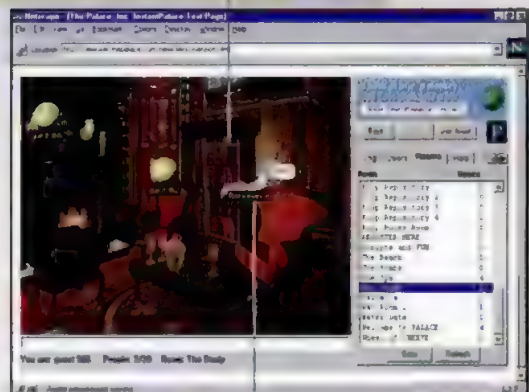


You participate in the conversation by typing your comments in this text box

Because it's HTML-based, you can still access the Web while you chat if you like

Java-based chat. The Java chat client applet speaks to the Java Chat Servlet through the Web server using HTTP. The Servlet processes the message, sending it back to the Web server to be distributed to each Java Chat client via HTTP.

Many chat rooms are not just independent entities but offer portals to other rooms



Avatars are personifications of you online. You are assigned a default avatar when you arrive, but you can customize it

use a complicated command line interface to access these features—an interface that is more at home in Unix than in the point-and-click world of Microsoft Windows.

From the client perspective, Chat Server provides a basic, no-frills chat experience. To participate in a chat, you type your text into a box at the top of the screen. Each user's input appears in a large window in the lower half of the browser window. A pull-down actions menu lets you send your message to selected users or to the entire group. It's basic, effective chat, but not as much fun as The Palace or Virtual Places and not as powerful as eShare Expressions or Rooms.

Chat Server was more difficult to install than the other products we tested. Each chat room requires a separate instance of the Chat Server program, each operating on a different port number, which was a bit more work than we would have liked. Chat Server comes as a single .ZIP file, but no installation program is included. A helpful installation guide is provided in Adobe Acrobat format, but you must manually create some configuration files before you can run Chat Server.

Chat Server is designed to be installed as part of an existing Web site, so its user interface is minimal. Instead, Magma suggests that you create an "entry page" on your Web server where users can select the chat room they want. Magma supplies sample HTML code to help you build an entry page, and we were able to create our own bare-bones entry page in a few minutes.—*Les Freed*

Chat Server 1.59d. List price: \$2,100 Canadian (about \$1,550 U.S.). Magma Communications Ltd., Nepean, Ontario, Canada; 613-228-3565; fax, 613-228-8313; chat.magma.ca. **Circle 481 on reader service card.**

E-Pub Services Ltd.

E-Pub Chat

Offering simplicity and core functionality for a chat server, E-Pub Chat 1.01 (\$995 list) is a graphical, Java-based chat system that does not have enough advanced features to compete with eShare Expressions, Rooms, or The Palace.

Our Contributors: HEATH H. HEREL is a consultant at Walker Systems Support, a computer management and support firm. SHERYL CANTER and LES FREED are contributing editors of *PC Magazine*. JAY MUNRO was the project leader, and DAVID LIDSKY was the associate editor in charge of this story.

Editors' Choice

• Rooms 3.0



Chat on the Web has the potential to bring people together, but the proper environment is all-important. Only one chat product gave us the flexibility appropriate for both our office and our public Web site, and so we award our Editors' Choice to Rooms 3.0, from ichat.

You have a great amount of configurability to create your chat world as you please with Rooms. You can design the look and set access restrictions on a room-by-room basis. All this functionality is easy to set up with ichat's HTML-based administration tool.

Rooms gives you the ability to enable powerful and important business functions, such as guided tours and moderated event chats. In a commercial setting, you can let users create their own

sessions, Rooms, or The Palace. The graphical environment is largely window dressing, making the client experience appear more fun at first glance than it actually is. E-Pub Chat can operate as a standalone chat server, or it can be easily integrated into any Java-capable Web server. E-Pub Chat 1.1, which should be available by the time you read this, will feature some enhancements that will make the client more user-friendly.

E-Pub Chat offers a graphical chat environment, but its use of avatars is almost incidental. Users can't choose their own avatars, nor can they move their avatars around on the screen. This is much less fun than The Palace, in which creating your own avatar and moving it around is the name of the game. Some corporate implementations may find this level of control desirable, but it adds little beyond text

Chat on the Web has the potential to bring people together, but the proper environment is all-important.

Only one chat product gave us the flexibility appropriate for both our office

and our public Web site, and so we award our Editors' Choice to Rooms 3.0, from ichat.

You have a great amount of configurability to create your chat world as you please with Rooms. You can design the look and set access restrictions on a room-by-room basis. All this functionality is easy to set up with ichat's HTML-based administration tool.

Rooms gives you the ability to enable powerful and important business functions, such as guided tours and moderated event chats. In a commercial setting, you can let users create their own

avatars, and monitoring your chat rooms has never been easier with the "bots" you can place in rooms to enforce site rules.

We give an honorable mention to The Palace. We have never had more fun chatting on the Web. The Palace's unique visual environment immediately sets you at ease, and you can create your own identity with its custom avatar support. The Palace has thousands of active rooms, so finding someone to talk to and a topic of interest is very easy. It may be a bit too whimsical to use in a workplace environment, however, but it's ideal for leisure.

chat. Version 1.1 will add the ability for administrators to offer custom avatars.

Your words appear above your avatar for a few seconds after you type them in. If you miss something, you can use the



E-Pub Chat's graphical elements feel like more window dressing; you can't move your avatar around.

chat review function to see the last few lines from each participant or from the entire chat room. The Palace has a similar feature, but it's in a separate window and only shows the last few lines of conversation. A private conversation option allows participants to send private messages to one another, but you can't set up a private chat room as you can in the

**THE EDITORS AT PC MAGAZINE
NOW IT'S EASIER**

Dell Computer Corp.

Dimension XPS M233s

Once again, Dell has fashioned an optimal machine for the small- and medium-business set. In addition to being the leading based performer in our

**THE DELL DIMENSION XPS M233s HAS WON THE
PRESTIGIOUS PC MAGAZINE EDITORS' CHOICE AWARD.**

HAVE MADE THEIR CHOICE. TO MAKE YOURS.

DELL DIMENSION® XPS M266 266MHz PENTIUM® II PROCESSOR FEATURING MMX™ TECHNOLOGY

- 64MB EDO Memory with ECC
- 512KB Integrated L2 Cache
- NEW 7GB Hard Drive (10ms)
- NEW 1000TX Trinitron® Monitor (15.9" v.i.s., .26dp)
- NEW Matrox Millennium II 4MB WRAM Video Card
- NEW 24X Max® Variable CD-ROM Drive
- Integrated Yamaha 16-Bit Sound
- Altec Lansing ACS-90 Speakers
- NEW 56K Capable** U.S.R. x2 Modem
- Iomega Zip 100MB IDE Internal Drive with One Cartridge
- Microsoft® Office 97 Small Business Edition plus Bookshelf 96
- MS Windows® 95/MS IntelliMouse
- 3 Year Limited Warranty¹ with 1 Year On-site³ Service

\$3299

Business Lease: \$116/Mo
Order Code #500843

DELL DIMENSION XPS M233s 233MHz PENTIUM® PROCESSOR WITH MMX TECHNOLOGY

- 64MB SDRAM Memory
- 512KB Single Bank Pipeline Burst Cache
- NEW 6.4GB Hard Drive (9.5ms)
- NEW 1000TX Trinitron Monitor (15.9" v.i.s., .26dp)
- NEW Matrox Millennium II 8MB WRAM Video Card
- NEW 24X Max® Variable CD-ROM Drive
- Sound Blaster 16 WaveSynth Wavetable Sound
- Altec Lansing ACS-90 Speakers
- Iomega Zip 100MB IDE Internal Drive with One Cartridge
- Microsoft Office 97 Small Business Edition plus Bookshelf 96
- MS Windows 95/MS IntelliMouse
- 3 Year Limited Warranty with 1 Year On-site Service

\$2899

Business Lease: \$105/Mo.
Order Code #500842

DELL DIMENSION XPS M233s 233MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- 32MB SDRAM Memory
- 512KB Single Bank Pipeline Burst Cache
- 4.3GB Hard Drive (10ms)
- NEW 1000TX Trinitron Monitor (15.9" v.i.s., .26dp)
- NEW Matrox Millennium II 4MB WRAM Video Card
- NEW 24X Max® Variable CD-ROM Drive
- Sound Blaster 16 WaveSynth Wavetable Sound
- Altec Lansing ACS-90 Speakers
- Microsoft Office 97 Small Business Edition plus Bookshelf 96
- MS Windows 95/MS IntelliMouse
- 3 Year Limited Warranty with 1 Year On-site Service
- ★ Upgrade to 64MB SDRAM, add \$199

\$2399

Business Lease: \$87/Mo
Order Code #500825

DELL DIMENSION M200s 200MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- 16MB SDRAM Memory
- 512KB Single Bank Pipeline Burst Cache
- 3.2GB Hard Drive (12ms)
- NEW 800LS Monitor (13.7" v.i.s.)
- 2MB EDO VIRGE 3D Video
- NEW 24X Max® Variable CD-ROM Drive
- Microsoft Office 97 Small Business Edition plus Bookshelf 96
- MS Windows 95/MS Mouse
- 3 Year Limited Warranty with 1 Year On-site Service
- ★ Upgrade to 32MB SDRAM, add \$99
- ★ Upgrade to an 800HS Trinitron Monitor (13.7" v.i.s., .26dp), add \$49
- ★ 3Com® 3C905 Fast EtherLink® XL 10/100 PCI Card, add \$99

PICTURED SYSTEM

\$1699

Business Lease: \$61/Mo.
Order Code #500805



Put down your buyer's guides and silence your brother-in-law. Because *PC Magazine's* editors have just christened the Dell Dimension XPS M233s "an optimal machine for the small- and medium-business set" making the search for the perfect desktop a whole lot easier. And like all of its predecessors in the award-winning Dell Dimension line, this system is loaded with great features. And judging from our outstanding performance in *PC Magazine's* benchmark tests you'd be hard pressed to find better performance in another small- or medium-sized business desktop system. Plus, we were the only manufacturer to receive an "A" grade on both desktops and notebooks from *PC Magazine's* Service and Reliability readers' survey (July '97 issue). So if you're looking for a tip, a sign from above, or just a nudge in the right direction – relax and give us a call. The hardest part is over.

DELL®

TO ORDER TOLL-FREE

800-660-8655

TO ORDER ONLINE

www.dell.com/buydell

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT
Sun 12pm-5pm CT In Canada, call 800-233-0702
GSA Contract #GS-35F-4076D

Keycode #04522



For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., Attn: Warranty, One Dell Way, Round Rock, TX 78682. On-site service provided by an independent third-party provider. May not be available in certain remote areas. *24X Max/12X Min. **x2 products are capable of 56Kbps downloads. Due to FCC rules that restrict power output, however, current download speeds are limited to 33.6 Kbps. Upload speeds are limited to 33.6 Kbps. Actual speeds may vary depending on line conditions. †Advertised systems may differ from tested configurations. *Prices and specifications valid in the U.S. only and subject to change without notice. Intel, the Intel Inside logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. MS, Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. ©1997 Dell Computer Corporation. Reprinted from PC Magazine, © Ziff-Davis Inc. 1997. All rights reserved.

Chatting Up a Storm

Test-drive the products we review here and see for yourself what people on the Web are talking about.

	Sample Web sites*	Comments
 Chat Server chat.magma.ca	Ottawa.com (www.ottawa.com), The Ottawa Lynx (www.ottawalynx.com)	This Canadian company has its major presence in Ottawa with these local sites, which use Magma's basic chat solution.
 E-Pub Chat www.e-pub.com	CBS Sportsline Team Trivia (www.oasisgames.com/cbs/cbs.html)	E-Pub has no pure chat implementations at press time other than its own site, but this online game gives a good feel for what E-Pub Chat can do.
 eShare Expressions www.eshare.com	GeoCities (www.geocities.com), Unet (www.uu.net)	With eShare's technology enabled on the world's most popular online community, you have plenty of people with whom to share your opinions.
 The Palace www.thepalace.com	Compaq (www.compaq.com), Intel (www.intel.com), SonicNet (www.sonicnet.com)	This whimsical chat product is used by some impressive computer sites, and it gives you access to thousands of rooms on a wide range of topics.
 Rooms 3.0 www.ichat.com	iVillage (www.ivillage.com), Pathfinder (www.pathfinder.com), Yahoo! (www.yahoo.com)	It's no surprise that this flexible and powerful chat solution can be found on so many major Web sites.
 Virtual Places www.vplaces.com	Excite (www.excite.com), ZDNet (www.zdnet.com)	The point of Virtual Places is that you can go anywhere on the Web to chat, but these sites are a great place to start.
 VolanoChat www.volano.com	SureSite (www.suresite.com), University of Houston (www.uh.edu)	Volano proves that chat can be an effective part of distance learning as well as a tool for community building.

* You can find a more complete list of each company's chat implementations by visiting its Web site.

other graphical chat products.

An E-Pub server can have any number of chat rooms, each with its own look and feel. E-Pub Chat comes with three ready-made chat rooms, and a provided chat-room-designer applet lets you create your own chat rooms. You build a chat room by assembling GIF and JPEG images, one for the background and one for each participant. A chat room can have separate avatars for each participant, links to Web sites, and animated banners.—*LF*

E-Pub Chat 1.01. List price: For unlimited rooms, \$995. E-Pub Services Ltd., New York; 212-334-5151; fax, 212-334-4646; www.e-pub.com. **Circle 482 on reader service card.**

eShare Technologies Inc.

eShare Expressions

For nose-to-the-grindstone business conferencing, eShare Expressions 1.1 (\$295 to \$4,995 list, depending on the number of clients) offers an excellent combination of fun and functionality. Its attractive and responsive Java clients handle basic chat well, and you can insert emoticons into

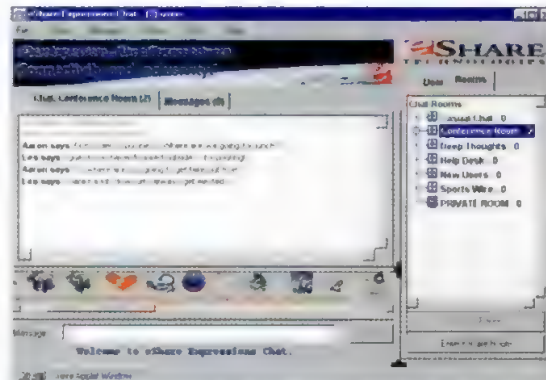
the text stream to add a little fun. Expressions also has superb security and control features for administrators.

To join or start a chat session, you connect to the Expressions server with your browser and then click on "Chat." The server asks you to provide a user name and then downloads either of two Java-based client applets to your PC. (Version 2.0 of Expressions, released as we went to press, also offers an HTML version of its client.) The full Java client provides a more graphical interface to the chat system but takes longer to download. It displays a scrollable list of expression icons, which you can send to other users. Icons denote "coffee break," "handshake," "thumbs-up," and so on.

The "Java Light" client is more text-oriented than the full Java client but downloads quicker and requires less memory to run. It lacks the scrollable display, but users can still send icons by typing the name of the icon. The full client displays a graphi-

cal, tree-style list of conference rooms and users, while the light version makes do with a text-based version of the list.

We found Expressions to be the easiest chat server to install and configure. Installation takes just a few minutes, and the default, generic configuration is usable right out of the box. The Expressions server allows a high degree of customization and access control. A configuration program lets you make changes from the server itself or from designated worksta-



eShare Expressions lets you insert emoticons into the text stream for an added bit of fun.

Philips Brilliance® Monitors
bring out your best.



BRILLIANCE®
HIGH RESOLUTION MONITORS

Philips Brilliance monitors bring out your best on the PC screen with pixel perfect display plus incredibly high resolution, color, accuracy, contrast and consistency. They're available in 15", 17", and 21" inch sizes. So, whether you're a design professional, office or small business user, or serious game player, we have the right size monitors for you. Look into a Philips Brilliance monitors today.

BU Monitors Website: [www: http://www.monitors.be.philips.com](http://www.monitors.be.philips.com) or fax
Europe: 31-40-273-5412 USA: 1-770-821-2228 Asia Pacific: 852-2-866-7358



Let's make things better.

PHILIPS

CIRCLE 021 ON READER SERVICE CARD

One-on-One Chat in an Instant

Instant messaging (IM) products let you send messages to colleagues anywhere online, regardless of your or their ISP. They differ from IRC clients because they notify you of incoming messages while you do other work on your computer. Some open a message window, some sound an alarm, and some blink a special icon. All offer protection against unwanted messages.

Of the five products we tested, all but **Firefly Passport** (www.firefly.com) require you to download and install software. Firefly is written in Java and runs in a browser window, making it platform-independent but extremely slow. Firefly doesn't let you search for users by their e-mail addresses, so if you don't know users' Firefly names, you won't be able to find them. But if you like to meet people, you

can find those who share your interests in films, music, or Web sites by rating items in a Firefly Web application. (For more on Firefly, see "Advice from the Web" in this issue.)

ICQ (www.mirabilis.com) is the most full-featured IM product of this bunch, except in one detail: It lacks proxy sup-

port, so you can't access it from behind a firewall.

ICQ is the only product we tested whose chat feature shows you what the other person is typing in real time. It also supports rich text, notifies you when you receive e-mail, and let you access group games.

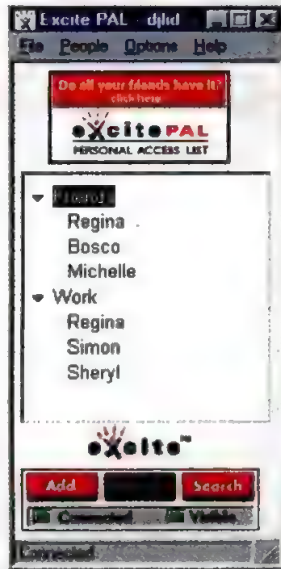
Excite PAL (pal.excite.com) doesn't offer the rich feature set of ICQ, but it's cleanly designed and easy to start using right away. It also includes proxy support for those accessing it from behind a firewall.

When you add people to

your list, you assign them to groups.

Advice iChat Pager (www.ichat.com) is the most awkward to use of the products we tested, because it separates the paging function from the chatting function, and its interface takes some time to learn. It does offer some nice features though, letting you page people off-line and send files and live URLs. You have to use the Quick Chat feature to follow a conversation thread, opening a chat window in your browser. You will need to read the help files to understand how to use iChat Pager, but once you've done so, it might be the most appropriate of these products for business use.

AOL Instant Messenger (www.aol.com) had the slimmest feature set of the products we tested. You also will have trouble finding the names of others using the service. The AOL NetFind button brings you to a general white pages-type site that doesn't tell you screen names for AOL Instant Messaging users who are not also AOL members, and if you are not a member, you cannot access AOL member screen names.—*Sheryl Canter*



PAL, made by Virtual Places, is one of the better IM products.

tions on the LAN. Like many Web server programs, Expressions supports *multi-homing*, a feature that lets one machine host several different Expressions servers, each with its own IP address.

Expressions makes extensive use of HTML. The backgrounds, banners, scrolling message bar, and menu choices are all HTML files, which you can customize with any HTML editor. Expressions also lets you customize the size, font, and color of the client display.

Expressions supports banner-type advertisements, similar to the ones you see on many commercial Web pages. (Softbank, the parent company of Ziff-Davis and *PC Magazine*, is an investor in eShare Technologies.)—*LF*

eShare Expressions. List price: \$295 to \$4,995. eShare Technologies Inc., Commack, NY; 888-374-2734, 516-864-4700; www.eshare.com. Circle 483 on reader service card.

The Palace Inc.

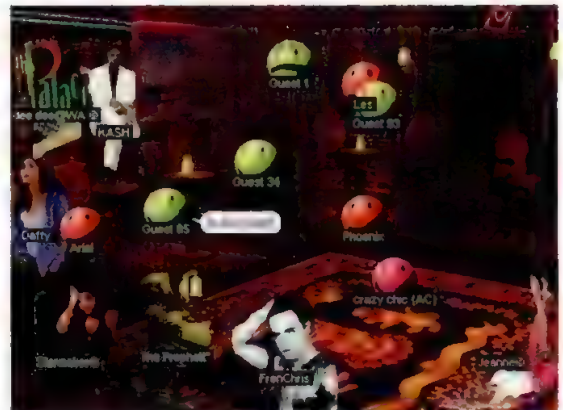
The Palace

Think IRC meets Super Mario Brothers and you'll understand The Palace 1.1. Using detailed graphics, animated avatars, and sound, The Palace creates the most compelling real-time conversation tool for recreational use. We feel that it is not appropriate for a corporate audience looking for a productivity application, though—the avatars and graphical backgrounds ultimately prove distracting in that setting.

The Palace takes the meaning of "chat room" to a new level. Each room can have its own look, with detailed graphics, doors, buttons, and links to other rooms, servers, or Web pages. Thousands of Palace

servers exist on the Internet for you to explore.

The Palace client, in either its standalone version (\$39.95 list) or as a free Java applet (which gives you guest privileges), resembles an adventure game. To move your avatar around a Palace server,



The richly graphical Palace environment makes chat a much more enjoyable experience.

Simply



OUTSTANDING

Vector illustration created exclusively with CorelDRAW by John Corkery, U.S.A.



CorelDRAW™ 7

Includes . . .

Corel PHOTO-PAINT™ 7



CorelDREAM 3D 7



COREL DRAW™ 7

Productivity, Power and Precision!

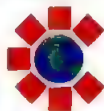
Producing outstanding illustrations is an incredibly smooth process with the revolutionary performance and power of CorelDRAW™ 7. This precision software lets you transform the masterpieces in your imagination into breathtaking reality. With Corel PHOTO-PAINT™ 7 for photo editing and bitmap creation, and CorelDREAM 3D 7 for 3D modeling and rendering, this award-winning graphics suite helps you tap into new creative worlds. It's the software of choice for the illustration professional.

Also included:

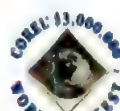
- Eight powerful utilities
- 32,000 clipart images and symbols
- 1,000 photos
- 1,000 TrueType® and Type 1 fonts
- Over 450 CorelDRAW™ templates
- Over 250 3D models
- Over 750 floating objects



\$249.99
Limited time
CorelDRAW 7.0.1 or 6



1997 WORLD COMMUNICATIONS AND DESIGN AWARD



To find out how to enter
visit our website at
www.corel.com/contests



*Suggested retail price plus applicable taxes in US. Dealer may sell for less. Prices may vary from location to location.

COREL
www.corel.com
Call now for faxed literature!
1-613-728-0826 ext. 3080
Document # 1085

Decisions Decisions

233MHz Intel Pentium®
Processor with MMX™
Enhanced Technology? or 233MHz AMD-K6™
Processor with MMX™
Enhanced Technology?



Processor:
233MHz Intel Pentium®
MMX™

Memory: 32MB

Cache: 512 KB

Hard Drive: 3.8GB

CD-ROM: 24X

Video Card: 3-D

Video Memory: 4MB

Modem: 56Kbps Internal
Modem w/voice, Full Duplex
and Speaker Phone

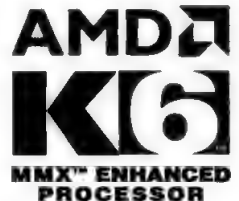
Sound Card: 16-bit

Speaker System:
20 Watt, 3-D

Loaded Software:
Windows95
Microsoft Works
Microsoft Money; Encarta
97 and Golf 3.0



Selecting a new computer is a dilemma when Techmedia offers a choice between two leading-edge 233MHz PC systems, with MMX enhanced technology. One hand, there's the system built around the famous Intel Pentium processor—on the other, a system designed from the revolutionary AMD-K6 processor. Fortunately, they both offer unprecedented speed for Windows applications. They're both packed with superior memory, storage and multimedia features to make your computing experience most efficient, even fun. And, if either of these decisions sounds expensive, look again. They are available at mainstream prices. Whatever your decision, Techmedia is the right answer.



Processor:
233 MHz AMD-K6 with Intel
MMX™ Enhancement

Memory: 32MB

Cache: 512 KB

Hard Drive: 3.8GB

CD-ROM: 24X

Video Card: 3-D

Video Memory: 4MB

Modem: 56Kbps Internal
Modem w/voice, Full Duplex
and Speaker Phone

Sound Card: 16-bit

Speakers System:
20 Watt, 3-D

Loaded Software:
Windows95
Microsoft Works
Microsoft Money; Encarta 97
and Golf 3.0

Techmedia®

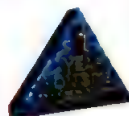
© Techmedia logo is a registered trademark of Techmedia Computer Systems Corp. AMD, combinations thereof and AMD-K6 are trademarks of Advanced Micro Devices, Inc. Microsoft and Windows are registered trademarks, and Windows95 is a trademark of Microsoft Corporation. Intel is a trademark of Intel Corp. © 1997, Techmedia HPC/233K/8/4



(800) 753-1773

Tiger Direct!

(800) 335-4062



Web Site: <http://www.techmedia.net>
Sales : 800-379-0077
Sales Fax : 714-379-9069

SUMMARY OF FEATURES

See www.pcmag.com for interactive views

Chat Software

■ YES □ NO

Products listed in alphabetical order

Client Side

Client has HTML/proprietary versions

Client has Java/IRC versions

Full-featured client download size

User can move/resize client window

Chat room window independent of browser

User can chat in multiple rooms simultaneously

User can see other available rooms/servers

User can insert/create/edit avatars

User can select type face/color/size

Emotion descriptors available

User can set up private chat room

User has a password-protected user profile

Server Side

Remote administration via Java/HTML/proprietary interface

Supports multihoming

Integrated Web server

Server performance monitor

Can monitor private chat rooms

Accepts connections from IRC clients

Can control access based on domain

Controls client interface/text/language

Can perform real-time monitoring

Administrator has kick and ban control

Chat Server
1.59d

E-Pub Chat 1.01

eShare
Expressions 1.1

The Palace 1.1

Rooms 3.0

Virtual Places
2.1

VolanoChat 1.1

Client has HTML/proprietary versions	■	■	■	■	■	■	■
Client has Java/IRC versions	■	■	■	■	■	■	■
Full-featured client download size	Less than 100K	About 100K	Less than 100K	2.4MB	Java, 20K; IE, 550K; Navigator, 1.2MB	About 1.5MB	Less than 100K
User can move/resize client window	■	■	■	■	■	■	■
Chat room window independent of browser	■	■	■	■	■	■	■
User can chat in multiple rooms simultaneously	■	■	■	■	■	■	■
User can see other available rooms/servers	■	■	■	■	■	■	■
User can insert/create/edit avatars	■	■	■	■	■	■	■
User can select type face/color/size	■	■	■	■	■	■	■
Emotion descriptors available	■	■	■	■	■	■	■
User can set up private chat room	■	■	■	■	■	■	■
User has a password-protected user profile	■	■	■	■	■	■	■
Remote administration via Java/HTML/proprietary interface	■	■	■	■	■	■	■
Supports multihoming	■	■	■	■	■	■	■
Integrated Web server	■	■	■	■	■	■	■
Server performance monitor	■	■	■	■	■	■	■
Can monitor private chat rooms	■	■	■	■	■	■	■
Accepts connections from IRC clients	■	■	■	■	■	■	■
Can control access based on domain	■	■	■	■	■	■	■
Controls client interface/text/language	■	■	■	■	■	■	■
Can perform real-time monitoring	■	■	■	■	■	■	■
Administrator has kick and ban control	■	■	■	■	■	■	■

you simply move your mouse pointer and click. When you send a message, a cartoon-style balloon appears next to your avatar, "speaking" the text you typed. A toolbox lets you change your avatar's appearance; you can also scan in your own.

The Palace offers its server for Microsoft Windows, Macintosh, and Unix platforms. You can get a Personal Palace Server that can host up to 20 users, and you get the Palace Presents auditorium feature for \$99. We tested the Windows NT version of the server; it was simple to install and administer.

The administration console is the best of the bunch. The Palace admin console installs as a control panel on the server. It's a single, four-tab dialog box that lets you fine-tune the server without having to learn lots of technical details. (Softbank, the parent company of Ziff-Davis and *PC Magazine*, is an investor in The Palace.)—LF

The Palace Server 1.1. List price: For 100 users, \$2,995. **The Palace Client.** List price: \$39.95. The Palace Inc., Beaverton, OR; 503-626-7575; fax, 503-626-8065; www.thepalace.com. Circle 485 on reader service card.

ichat Inc.

Rooms

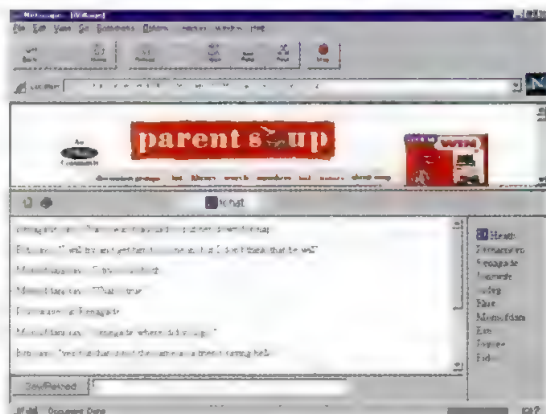


Webmasters seeking a powerful and highly customizable chat solution that isn't all fun and games will find Rooms 3.0 (\$595 list for 25 users) the best possible choice. You have great flexibility as both the user, being able to create your own avatars, and as an administrator, monitoring user activity and custom creating your Rooms to be the best product if you're interested in both a commercial Web chat application and if you want a real-time communication tool for work.

As the user, you can choose from a series of avatars or submit your own. Your avatar appears next to the text you enter in the chat window, providing an identifier each time you speak. Private messages are handled directly in the chat window, which can make it difficult to keep track of a private con-

versation in a busy chat area. Rooms also supports private rooms, into which you can invite as many people as you wish.

The ichat server is where the true power lies. The HTML-based administration tool lets you customize all of the features in your chat world. The access control module, while not quite as powerful as Volano's, is impressive, allowing site restrictions based on IP address and restricted access to certain rooms. The administrator has the ability to approve and deny requests for custom avatars and to administer word filters.



Rooms' flexibility makes it the ideal product for Web sites and work-groups.

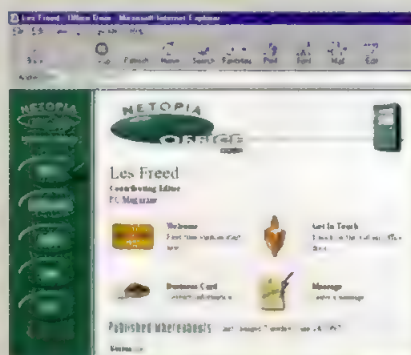
Virtually at Work

We've been accessing the Web from our desktops for several years now. A new category of products called *virtual offices* turns the tables by putting your desktop—even your entire office—on the Web. What's a virtual office? It's a Web-based representation of your real office. Virtual office solutions provide messaging and collaboration tools to let distant users share files, chat, and send messages, but they don't provide traditional workgroup discussion tools like those found in Lotus Notes.

To get a feel for the technology, we looked at two products at opposite ends of the virtual office scale and previewed a third product that should be available by the time you read this.

Farallon's **Netopia Virtual Office** (\$49.95, www.farallon.com) provides an online office that visitors can access via the Web. You basically have a miniature Web server that runs on your desktop PC. Anyone (including you, if you're traveling) can connect to your virtual office from any Web browser.

When users connect, they are greeted by a screen called the Office Door.



Netopia Virtual Office can recreate your real-world office on the Web.

Users can click on the knocker to see if you are at your computer or click on the notepad to leave you a text message. Visitors can also request a chat, send and receive files, or even control your computer. An access list lets you specify which users have access to which tools. If a user wants to chat or to control your PC, a message box pops up, identifying the user and asking if you wish to grant access.

HotOffice (www.hotoffice.com) is a virtual office hosting service designed to be accessed only by its users and not

outsiders. For \$29.95 per month per user, HotOffice acts as your private network by providing tools that let users share files, hold chat meetings, and exchange messages, calendars, and other data with other HotOffice users in your company. You access your HotOffice virtual office via the Internet, using any standard browser.

Instinctive Technology's **eRoom** (Price not yet determined at press time, www.instinctive.com) acts as a virtual conference room where your workgroup can share files and make decisions. eRoom sits on top of your Windows NT server running IIS. Any user can set up an eRoom and name it, and the program will generate a URL for it. You can then invite people to your room and design it. A wizard produces page templates for various work aspects such as folders, notes, and polling.

Once in your eRoom, you can use any desktop application from within your browser (or in a viewer), dragging and dropping files to edit with your team. In addition, eRoom adds access control and version control (to keep track of your changes).—LF

The robust administration tools also let you expand your ichat world easily by making it accessible to IRC and telnet clients. It also supports IRC-style commands typed directly into the chat window, such as *Finger* and *Whois*. As in Virtual Places, further expansion is possible by enabling staged events and guided tours from your world; ichat is also fully extensible through custom-designed *bots*. Bots are simple programs that act like users, performing tasks such as greeting users, enforcing site rules, and disciplining chatters if necessary.

Designing and modifying your ichat world is done quickly and painlessly through the administration tool. The Design Center gives you the power to customize each room in your world completely. —Heath H. Herel

Rooms 3.0. List price: For 25 users, \$595. ichat Inc., Austin, TX; 512-425-2277; fax, 512-719-8225; www.ichat.com. Circle 484 on reader service card.

Ubique Ltd.

Virtual Places

Taking chat beyond traditional rooms, Virtual Places 2.1 opens up entire communities on the Internet. The chat client is exceptional, deftly combining a Web browser with the chat software. Its features let you create a chat environment that is as fun as it is powerful. While Virtual Places' online events and guided tour functions have business applications, the overall experience is too fanciful for anything but commercial Web sites.

Virtual Places gives you both traditional text-based chat and a graphical representation directly on the Web page, where your avatar speaks using comic-strip balloons, much like The Palace. You can select from a series of default avatars or design one for yourself. Each avatar contains images representing a range of emotions and gestures, making it easy to convey

anger or just simply to wave hello and add tone and body language to your words.

Virtual Places boasts several features that help create communities. If you want to do an online demonstration and give participants chat capabilities, the guided tour feature lets you set up or join guided tours around the Internet, in which several users follow as a "tour guide" jumps from one URL to the next, conversing throughout the tour. You can also stage online events in a community auditorium. Users can listen to a featured speaker and ask questions. You can also chat with other people in your "row."

The server components install easily but require a great deal of memory and processor speed. The HTML-based administration is easy to handle remotely. Virtual Places includes strong monitoring tools such as word-filtering, which can screen out and replace objectionable content. Access control was not as full fea-

UMMA IS A BELLA ARE YOU TREBLE REBEL REBEL ON THE DOUBLE TO SOME TROUBLE.

The headline makes absolutely no sense. Neither does buying NT PCs for mission critical, complex applications. Especially when the new Sun Ultra™ 30 workstation performs compute-intensive chip simulation and 3D graphics with a speed and accuracy never before seen. Ultra 30's breakaway technology allows your departments to simultaneously network, collaborate, access data, design, and print faster than ever before. (Check specs below and then come back here, please.) For more information, visit us at www.sun.com/q-pcmag



Sun Ultra 30

- 300Mhz RISC processor.
- The industry's first dedicated 66Mhz PCI bus for faster networking and I/O throughput.
- Double the floating point performance of any PC workstation for intense graphics and simulation computations.
- 2MB cache per processor for faster performance (the fastest NT PCs only have .5MB cache memory per processor).
- Sun system's bus architecture with 1.6GB/sec throughput, three times faster than 528MB/sec NT PC throughput.
- Accommodates two 24" wide-screen, high-resolution monitors (NT PCs can't handle one).

THE NETWORK IS THE COMPUTER™



STEVE JORDAHL

IS Analyst and Developer
McDonnell Douglas

Steve Jordahl is a hands-on guy. As MIS specialist and computer decision-maker for McDonnell Douglas, Steve works with people on the cutting edge of today's (and tomorrow's) aerospace technology. Whether they're designing science fiction-like space vehicles, logging flight data, or storing all kinds of top-secret stuff, the people who rely on Steve need space. Big space. Which is what they get when he hooks them up with a Jaz® drive.

So while the people in Steve's division work with space daily, when they need more of it, they rely on handy, removable Jaz disks.

Check out why McDonnell Douglas was among the first Jaz users at www.4inchesquare.com/pmg.



Super-Fast, Extremely Vast
PERSONAL HARD DRIVE.



"How we fit one interstellar launch vehicle,
a few thousand flight hours, and reams
of highly sensitive information into a
4 INCH SQUARE."



BECAUSE IT'S YOUR STUFF.™

© 1997 Iomega Corporation. Iomega, the Iomega logo, and Jaz are registered trademarks, and "Because It's Your Stuff" is a trademark, of Iomega Corporation. All other trademarks are property of their respective holders. The views expressed herein are the views of the endorser and are not the views of, and do not constitute an endorsement by, any person or firm for whom the endorser has provided services.



Virtual Places offers a fun graphical environment to host events and chat.

tured as in, say, VolanoChat. You cannot restrict access based on domain or IP address, and you can't permanently ban specific individuals from accessing your site.—HHH

Virtual Places 2.1. List price: For 25 users, free; up to 100 users, \$3,000. Ubique Ltd., Rehovot, Israel; 703-265-3103; fax, 703-265-3931; www.vplaces.com. **Circle 486 on reader service card.**

Volano LLC

VolanoChat

While VolanoChat 1.1 (\$495 list) doesn't provide the eye candy of The Palace or extended capabilities such as event hosting and guided tours, which competitors such as Rooms have, it does handle pure chatting extremely well. Starting to chat as a user is very easy with its Java client, but things are not as easy for administrators, given Volano's Unix-like feel when you're enabling any of its powerful access control features.

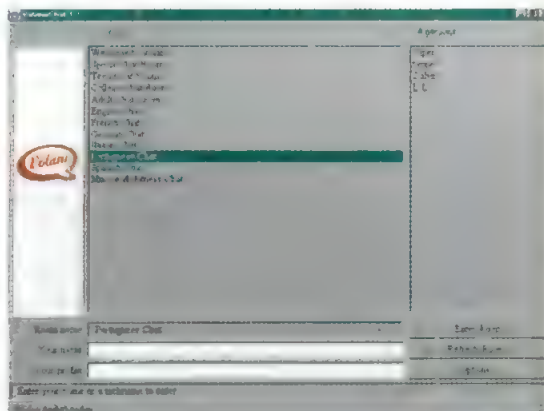
On the surface, the client isn't as impressive as some others—it lacks a graphical interface. VolanoChat does let you chat in multiple rooms simultaneously, which neither Rooms nor Virtual Places can accomplish without a separate instance of the client. To start a private conversation, simply double-click the name of anyone else in a room and begin. VolanoChat can be configured to run in any language by default, and you can host chat areas in multiple languages simultaneously.

Volano's access control features are very powerful, building on the model used by the

popular Apache Web server. As with Magma Communications' Chat Server, configuring Volano feels more like working in Unix than Windows. To implement the changes, you simply stop and restart the chat server. Unfortunately, this makes remote administration much more challenging, as it cannot be done by merely accessing the Web server with your browser. Monitoring the rooms is handled by a separate password-protected client, enabling real-time monitoring while you continue to be actively involved in the chat.

Setting up the VolanoChat server is simple if you are familiar with non-Windows environments. Unlike most of the other products in this roundup, VolanoChat does not automatically register itself and start up on a Windows NT server; it starts from a command prompt, so you can take the server down and restart it very quickly.—HHH

VolanoChat 1.1. List price: \$495. Volano LLC, San Francisco; 415-587-4297; fax, 415-680-2470; www.volano.com. **Circle 487 on reader service card.** □



VolanoChat offers a pretty basic Chat experience, but its out-of-the-box support is very impressive.



HIGH-PERFORMANCE BACKUP

- Back up one gig in as little as 10 minutes
- Free 1-Step™ backup software backs up as much as 2 gigs (compressed)
- Run your entire system straight from your Jaz® drive to instantly recover from hard disk crashes

HIGH CAPACITY MEETS INSTANT ACCESS

- Run applications and files straight from disk
- Access time: 15.5ms read/17.5ms write
- Average seek time: 10ms read/12ms write
- Sustained transfer rate: 6.62MB/sec. max
- MTBF: 250,000 hrs

HUGE FILES TO GO

- 1-gigabyte 4-inch disks fit in your pocket
- Portable external drives fit easily in your briefcase—internal drives also available
- Traveller and Jaz Cards make laptop use easy

PC AND MAC COMPATIBLE

- Windows 95, NT, and 3.X, Mac, DOS, OS/2
- IRIX and Solaris also available from Roke Data

HOW TO CONNECT:

- Jaz Jet™ SCSI PCI \$99
- Jaz Jet SCSI ISA \$89
- Jaz Traveller (Parallel Port) \$49
- Jaz Card (PCMCIA) \$125

VISIT WWW.IOMEGA.COM or see your reseller.



\$399 EXTERNAL



*When purchased in multi-packs. Prices listed are estimated street prices. Actual prices may vary. 1-Step and Jet are trademarks of Iomega Corporation. Windows 95 and Windows NT are trademarks of Microsoft Corporation. Mac is a trademark of Apple Computer, Inc. All other trademarks are property of their respective holders.

The story of a PC Card that's really a digital camera.



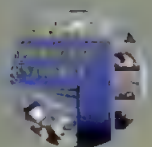
TAKE A PICTURE



OPEN CAMERA



INSERT PC CARD



SEE YOUR IMAGES



[Actual size. And darn near actual weight.]

It begins with a digital camera that weighs less than **six ounces**. A sleek, ultra-portable, silver slip of a thing that fits right into your pocket. So compact and lightweight, it seems more fiction than fact. Yet the plot thickens. The PDR-2 has a **built-in PC Card**. Simply open the camera and plug it right into your computer's PC Card slot, then download images in practically less time than it takes to say "cheese." **Removable SmartMedia™** flash memory cards give you unlimited storage capacity—a critical chapter in our story because you can reuse them thousands upon thousands of

times. When one card is full, you pop another one in just like a roll of film. And thanks to Toshiba's **CMOS sensor technology**, every single one of your batteries has a life span of more than 500 shots.

But the PDR-2 isn't only for

notebooks. An optional SmartMedia floppy disk adapter makes it just as easy to use with your desktop. Plus, it's compatible with PC and Mac. But the crux of the story is its price—a mere **\$499**. And that includes Image Expert™ software for bringing up the image "filmstrip" for quick read and drag-and-drop, as well as LivePix™ image enhancement software which comes complete with templates for making cards, calendars, posters, and more. To learn more, visit our Web site at www.toshiba.com/cab1.htm or call us at 1-800-288-1354 xCAB1. We'll give you the full story, unabridged.

In Touch with Tomorrow
TOSHIBA

CIRCLE 376 ON READER SERVICE CARD

©1997 Toshiba America Information Systems, Inc., Imaging Systems Division
SmartMedia is a trademark of Toshiba Corporation. Image Expert is a
trademark of Sierra Imaging and LivePix is a trademark of Live Pictures

Internet Service Providers

More Speed In the Pipeline



Internet service providers want you as a customer. Your choice should be based on more than price. We dialed into 13 national ISPs to help you decide.

By Tony Pompili

You love it, you hate it, but your Internet service provider (ISP) has become indispensable. As you spend more and more time surfing the Web, you've become sensitive to e-mail and network brownouts and fluctuations in throughput—to say nothing of busy signals. And the proliferation of big-name national ISPs with tempting access networks is making you feel that it may be time to switch. With an open field of evenly priced ISPs to choose from, is the grass really any greener on the other side of the connection? That's what we wanted to find out.

If you're considering switching ISPs, the reason probably has something to do with the tumultuous events that shook the ISP market this year. The trend toward flat-rate pricing became set in stone, with all of the major vendors offering unlimited access for \$19.95 per month. This, of course, triggered one of the most publicized debacles in online history, as America Online (AOL) customers encountered constant busy signals

IN THIS REVIEW

Online Services	EarthLink Network.....	226
America Online	IBM Internet Connection	226
CompuServe Interactive	MCI Internet.....	236
The Microsoft Network	MindSpring.....	236
Prodigy Internet.....	Netcomplete	240
Internet Service Providers	Sprint Internet Passport.....	244
AT&T WorldNet Service	SpryNet.....	245
Concentric Network	Choosing Your ISP	205

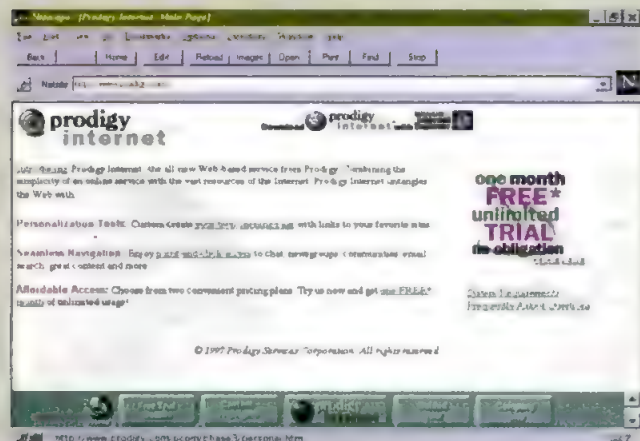
Editors' Choice

- EarthLink Network
- Prodigy Internet



It wasn't easy coming up with an Editors' Choice for this roundup of Internet service providers. The best

performers, such as IBM Internet Connection and Sprint Internet Passport, tended to be short on features. And the most feature-rich services, such as America Online, were found wanting in performance and user satisfaction. In the end, however, EarthLink Network and Prodigy Internet offer the best balance of acceptable performance and plentiful features. Both services achieved good performance scores on Inverse's tests. While results were not available for Prodigy, EarthLink succeeds in keeping its users happy,



caused by an undersupply of AOL-based modems. (AOL is currently upgrading its network to accommodate the extra traffic.) Traditional online services such as AOL, CompuServe, and Prodigy continued to blur the lines between their proprietary, content-rich online services and

their Internet access services. Prodigy, for example, late last year moved much of its online content to a new browser and Web serv-

er system and has ceased signing up new Prodigy Classic customers. Finally, all of the major ISPs have been confronted with

the game of technology catch-up, especially with the advent of higher-speed 56-Kbps modems. Modem standards based on Rockwell's K56flex and U.S. Robotics' x2 standards are forcing ISPs to make extensive investments in new modems.

Yet with all of the competition, the number of ISPs is on the rise. And not unlike PC trends of the past, ISP vendors are digging in, anticipating the inevitable shakeout that will most likely leave only a handful of providers standing.

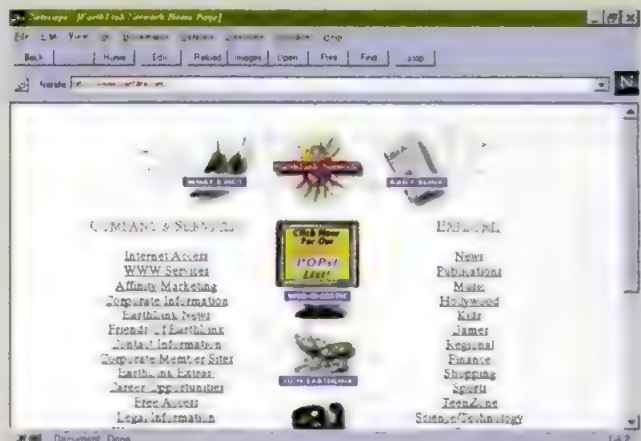
This year, some of the larger entrants came from the traditional telecommunications and network providers including IBM, MCI, and Sprint. In the light of America Online's problems, these companies are luring subscribers with promises of reliable service backed up by years of online experience.

according to our e-mail survey of user satisfaction. And both offer the features we feel an Internet service provider should offer, such as high-speed 56-Kbps connections, easy installation and configuration, and plentiful resources for hosting Web sites.

EarthLink is suited both for beginners who don't require lots of hand-holding and for advanced users who are more demanding. Prodigy Internet provides an attractive combination of the proprietary content and guidance for novices we've come to expect from an online service, together with strict adherence to Internet standards.

Honorable mentions go to IBM Internet Connection and Sprint Internet Passport for their top-notch performance. Unfortunately, both services are strictly for users who want fast access to the Internet and little else. Neither provides free Web hosting, for example.

We wish we could award an honorable mention to America Online, considering its ease of use and wealth of offerings. Unfortunately, America Online's scores on Inverse's performance tests were poor and user satisfaction left much to be desired, principally due to poor performance.



REVIEW CRITERIA

Our roundup looks at 13 ISPs. We looked for those with a national presence and local access in most regions of the U.S. We also required that they have a subscription base of more than 150,000 users. The products reviewed here are America Online, AT&T WorldNet Service, CompuServe Interactive, Concentric Network, EarthLink Network, IBM Internet Connection, MCI Internet, The Microsoft Network (MSN), MindSpring, Netcomplete, Prodigy, Sprint Internet Passport, and SpryNet.

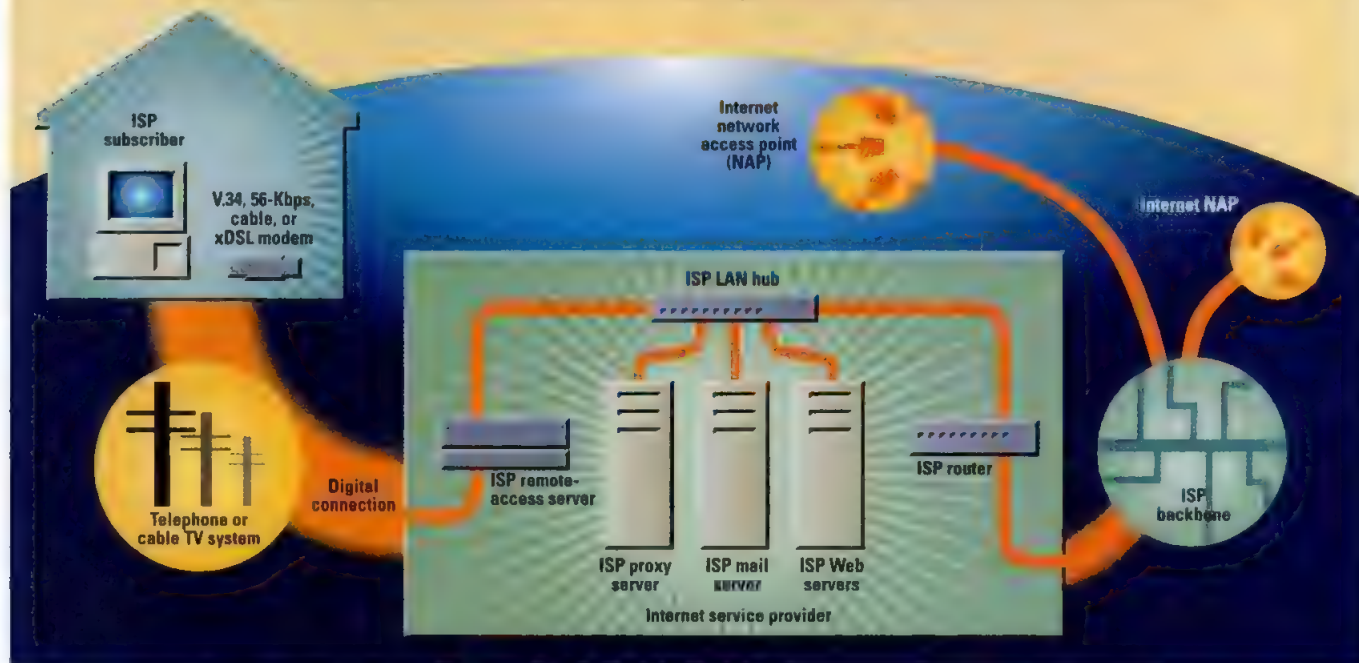
We looked at each product from three separate perspectives. To determine the access quality of each ISP, we enlisted the services of Inverse Network Technology, a firm based in Santa Clara, California, that measures and reports ISP performance by making over 60,000 phone calls

www.pcmag.com

Join us online to see the results of our online survey on ISP user satisfaction and discuss ISPs with senior networking editor Frank J. Derfler, Jr., and senior editor Leon Erlanger.

Anatomy of an ISP

Your ISP maintains services such as mail and proxy servers locally on a high-speed local area network. Requests that can't be satisfied locally go to an Internet network access point (NAP) for interconnection to Internet backbone circuits. The ISP contracts with telephone companies to provide access through local telephone numbers. Each telephone exchange with local access numbers is a *point of presence*.



to 12 of our 13 national providers, plus a few others, over several two-week periods—in our case, two weeks in May 1997. We took Inverse's results for a series of performance-related statistics, including the all-important connection success and frequency of disconnects during a session, and created performance ratings for each ISP. We also looked at features and created Suitability to Task ratings for each service. Finally, *PC Magazine* sent an informal e-mail survey of user satisfaction to hundreds of ISP users and compiled the results in a rating system. Keep in mind that the results of this survey may not be as projectable to all users as the results of our annual Service and Reliability Surveys; rather, the results describe the average responses of 30 or more individual users of each ISP. Surprisingly, despite sending out hundreds of e-mails, for three of the four online services we did not receive the 30 responses we required, which may be an indication of their declining popularity.

ONLINE ISPs VS. VANILLA ISPs

Our test group fell into two classic camps, ISPs and online services that offer ISP services. AOL, CompuServe, MSN, and Prodigy provide not only access to the Internet but also their own unique content, available only to subscribers. While online services claim to offer original content, it's hard to argue that much online content is unique anymore. For example, AOL offers the Newsstand service, a collection of periodicals and daily newspapers including *The New York Times*. Of course, the *Times* and other publications have their own Web sites with much the same content. To AOL's credit, its proprietary software is able to organize this information better, making it easier to locate and helping you to navigate among services.

AOL is not the only online service to offer its own client. Except for Prodigy, each of the online products reviewed here uses its own proprietary client software. We found that these clients gave the on-

line services a richer, better-integrated set of tools for delivering their services. AOL, for example, makes it easier to install and configure its client than do regular ISPs using off-the-shelf browsers, such as Microsoft Windows 95's Dial-Up Networking and Netscape Navigator.

AOL's users also enjoy more sophisticated mail than users of traditional ISPs, with rich-text features such as font colors, selection, and font sizes. For compatibility, SMTP/MIME mail, supported by the ISPs, offers only basic ASCII text with attachments. AOL also lets you have multiple mail accounts per subscription. Though some ISPs provide multiple accounts, the online services make managing these accounts simpler, since their client software lets you choose an alternative user from a simple drop-down list. ISPs make you manually reconfigure your browser and mail reader each time you switch accounts—a major nuisance.

We also found that online service software has better facilities for keeping its client software updated. AOL automatically notifies users at the end of a session if their software is dated and gives them the option of downloading and installing

Our Contributors: PADRAIC BOYLE and TONY POMPILI are contributing editors of *PC Magazine*. FRANK J. DERFLER, JR., is the senior networking editor of *PC Magazine*. ANDREW GO is a technical analyst at PC Magazine Labs. LEON ERLANGER was the senior editor in charge of this story, and JEFFERY G. WITT was the project leader.

new versions. ISPs, based on browsers, are less intuitive.

Straddling the fence, however, online services offering ISP services give you the option of using a standards-based browser such as Microsoft Internet Explorer (IE) when accessing their Internet services. This is a plus, since one of the reasons for the phenomenal growth of the Internet is its standardized interface in the form of familiar browsers.

THE ISPs

Most of the ISPs reviewed here use either Microsoft Internet Explorer or Netscape Navigator. As any surfer will attest, browsers and HTML pages, served up by Web servers, make it simple to move from site to site with little reeducation. Using URLs to move among Web sites and clicking on HTML links are all but second nature to any computer user today.

All the ISPs provide the basic Internet services. This includes access to newsgroups (NNTP servers), Domain Name Service (DNS) servers, and e-mail servers. All of the ISPs reviewed here—except AOL, CompuServe, and MSN—also provide POP3 e-mail servers. Most ISPs offer at least one mail account; IBM Internet Connection is more generous. It lets you have up to six mail accounts per subscription for free. MindSpring gives you the option of purchasing extra mail accounts. And most vendors, including IBM and MCI, use the news readers built into their browsers. MindSpring also supplies alternate readers such as Eudora Lite, providing a more flexible and easier-to-use interface.

YOUR OWN HOME PAGE

Like having our own telephone numbers, many of us want our own Web pages, and most ISPs have responded. Providing from 2MB to 5MB of Web space per subscription is fairly common. AOL offers some terrific authoring tools to make the whole process of managing and publishing your Web page simpler.

On the access side, the allure of 56-Kbps modems is clearly taking its toll on most providers we reviewed. At press time, most ISPs were still offering only limited numbers of trial modems, generally in the larger metropolitan markets such as Los Angeles or New York. ISDN

was more prevalent but still not available everywhere. Curiously, some telecommunications companies such as AT&T do not offer ISDN service at all.

For small businesses that want a more substantial presence on the Internet, some of the products we reviewed here provide higher-end virtual domain services. For an additional fee, companies such as IBM, MindSpring, and Prodigy will register your company with InterNic (the Internet supplier of domain names) and host your domain on their servers. So, if you had a company called AJP Consulting, you might set up a virtual domain called *ajp.com* on MindSpring. Then, instead of having your mail sent to some generic address like *tpompili@mindspring.net*, it would go instead to what appears to be your own domain called *tpompili@ajp.com*. These services vary from \$50 to \$1,400 per month with setup.

There hasn't been a better time to pick an ISP. Whether opting for an online service with ISP or vanilla ISP, the choice of services has never been greater, and pricing is simple. Most services also offer fixed usage rates, which are even lower. So for those not wanting unlimited access, subscribing to an ISP can be pretty inexpensive. Which ISP is best for you? Take a look at the reviews on the following pages. One of them is sure to be a pretty good fit.

Online Services

America Online Inc. **America Online**

America Online (AOL) continues to deliver an attractive mix of Internet connectivity and proprietary online content to a broad base of consumers. Unfortunately, AOL is still wrestling with the results of its ambitious marketing campaign last year, which attracted enough new users to overwhelm its available access modems. AOL's Inverse performance scores were the lowest in this roundup, and AOL earned the lowest satisfaction ratings in our informal ISP survey, mostly because users had problems connecting—and staying connect-



America Online users access the Internet via a proprietary Web browser and e-mail reader.

ed—to the service. AOL is currently upgrading its network to accommodate the extra traffic.

Besides its cookie-cutter \$19.95 pricing for unlimited access, which is the standard for most of the products in this roundup, AOL offers plans for as little as \$4.95 per month for limited usage: 3 hours per month and \$2.50 for each additional hour.

Though AOL enjoys the infamous reputation of serving up more busy signals than its competitors, it is equally famous for providing one of the simplest interfaces. Its opening Channels page displays a score of popular categories that the novice user can understand. Channels include Newsstand, with its newspapers and periodicals, as well as the popular live chat area People Connection.

On the Internet side, AOL has extended its simple graphical environment to help users navigate. The Internet Connection page offers a variety of services including FTP, Gopher, news, and the Web. Now when users want to download a file, it makes sense for them to select FTP and proceed from there.

Opening a Web site launches AOL's built-in browser. Though it doesn't have all the features of Microsoft Internet Explorer or Netscape Navigator, the AOL browser does a fair job of rendering pages. AOL uses the same mail client for both AOL and Internet mail. AOL users can take advantage of some basic rich-text formatting features such as font bolding, color, or italicizing. This formatting, of course, gets stripped out when a message is sent to an Internet recipient. AOL supports MIME, allowing attachments to be

**Now, tapping into the
technological resources
of one of the world's
largest computer
companies is as easy as
picking up the phone.**



An entirely new approach to buying computers.

You'll be amazed at the depth of resources you have at your disposal simply by calling our toll-free number. For starters, you'll be talking to one of our knowledgeable System Consultants. More than mere operators, they'll not only answer your call, they'll work closely with you to develop



Introducing NEC NOW.SM

unique solutions to your unique needs. And they have a lot of solutions at their disposal. After all, they're backed by a powerful, worldwide brand with a history of

Why NEC NOW?

- The security of partnering with a company known for its technological innovations.
- The flexibility of ordering direct or through a reseller.
- The expertise of System Consultants.
- The immediate availability of competitively priced products.
- The resources of one of the world's largest computer companies.



technological innovations. Like the first color laptop, one of the first portables with MMX™ technology, and NEC's most recent breakthrough: an entirely new way of using your telephone.

**BUILT
TO
ORDER**



©1997 NEC Computer Systems Division, Packard Bell NEC, Inc. NEC, Versa, and MultiSync are registered trademarks; VersaBay, A700, A500, C500, ESM, PortBar, MiniDock and Express5800 are trademarks, and UltraCare is a service mark of NEC Corporation, all used under license by Packard Bell NEC, Inc. Direction, VersaNote, VersaExec, and MagicEye are trademarks and NEC NOW is a service mark of Packard Bell NEC, Inc. Leasing based on typical 36-month lease with purchase option. Other lease options may be available, leasing arranged by third party leasing company to qualified customers. Prices do not include shipping or applicable sales tax, are valid in the US only and are subject to change without notice. Products and specifications are subject to change without notice. *Product is 56Kbps capable. However, due to FCC rules which restrict power output of the service providers' modems, current download speeds are limited to approximately 53Kbps. Actual speed may vary depending on line conditions. MS, IntelliMouse, Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. NetWare and Novell are registered trademarks of Novell, Inc. The Intel Inside logo, LANDesk and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. All other trademarks and registered trademarks are property of their respective owners.



NEC Versa® 6200 Series 17" Laptop Computer

Common Features: 64-bit CPU and 32-bit PCI Bus Architecture • 32-bit CardBus Support • 2MB VRAM • 16-bit Stereo Sound with 3D Spatializer Technology • VersaBay™ II Option Slot Accepts CD-ROM, Floppy Drive (both included), Optional 2nd Hard Drive and 2nd Battery • Lithium Ion Battery • Upgradeable 3-Year Limited Warranty

Versa 6200MX

- 13.3" XGA Active Matrix TFT Color Display
- 166MHz Pentium® processor with MMX technology
- 64MB RAM/3GB Hard Drive/10X avg CD-ROM
- "...best multimedia performer..." *Mobile Computing & Communications*, July 1997
- * Upgrade to 128MB RAM, add \$699
- * Optional 2nd Lithium Ion Battery, add \$199
- * Optional NEC Versa PortBar™ 6000 Port Replicator, add \$199
- * Optional NEC MiniDock™ 6000, add \$499

\$4999

Business Lease: \$175/mo.

Versa 6200MX

- 13.3" XGA Active Matrix TFT Color Display
- 166MHz Pentium processor with MMX technology
- 32MB RAM/2.1GB Hard Drive/10X avg CD-ROM
- * Upgrade to 64MB RAM, add \$299
- * Upgrade to 3GB Hard Drive, add \$299
- * Optional NEC MiniDock 6000, add \$499
- * Optional U.S. Robotics® x2™ XJACK® 56Kbps Fax Modem, add \$199
- * Upgrade to Microsoft® Windows NT® 4.0, add \$99

\$4399

Business Lease: \$154/mo.

NEC Versa® 6060 Series 17" Laptop Computer

Common Features: PCI Bus with 128-bit Graphics Accelerator • 32-bit CardBus Support • 2MB VRAM • 16-bit Stereo Sound with 3D Spatializer Technology • USB Port • VersaBay II Option Slot Accepts CD-ROM, Floppy Drive (both included), Optional 2nd Hard Drive and 2nd Battery • Lithium Ion Battery • Upgradeable 3-Year Limited Warranty

Versa 6060

- 166MHz Pentium processor with MMX technology
- 12.1" SVGA Active Matrix TFT Color Display
- 48MB RAM/2.1GB Hard Drive/20X max CD-ROM
- U.S. Robotics x2 XJACK 56Kbps Fax Modem
- MS® Windows NT 4.0 with Free Telephone Support
- * Optional NEC Docking Station 6000 Plus, add \$899

\$4099

Business Lease: \$143/mo.

Versa 6060

- 166MHz Pentium processor with MMX technology
- 12.1" SVGA Active Matrix TFT Color Display
- 16MB RAM/2.1GB Hard Drive/20X max CD-ROM
- * Upgrade to 48MB RAM, add \$299
- * Optional 2nd Lithium Ion Battery, add \$199
- * Optional U.S. Robotics x2 XJACK 56Kbps Fax Modem, add \$199
- * Optional NEC MiniDock 6000, add \$499

\$3499

Business Lease: \$126/mo.

NEC Direction® PCx 17" Desktop Computer

Common Features: Mini-Tower or Desktop Tool-Less Chassis • 24X max CD-ROM • 3.5" Floppy Drive • MS Windows® 95 • MS Office 97 SBE • 2 USB Ports • Microphone • Palmrest Keyboard and MS IntelliMouse® • 3-Year Limited Warranty with 1-Year On-Site Service

Direction SPT233

- 233MHz Pentium processor with MMX technology/512KB L2 Pipeline Burst Cache
- 7.0GB Ultra DMA Hard Drive/64MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec® ACS-45 Speakers/AWE32 Wavetable Audio
- Iomega® Zip Drive
- U.S. Robotics 56Kbps Data/Fax/Voice Modem
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade Video Memory to 8MB WRAM, add \$119
- * Upgrade to Altec ACS-410 Speakers with ACS-251 Subwoofer, add \$69

\$2899

Business Lease: \$104/mo.

Direction SPT233

- 233MHz Pentium processor with MMX technology/512KB L2 Pipeline Burst Cache
- 4.3GB Ultra DMA Hard Drive/32MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-45 Speakers/AWE32 Wavetable Audio
- Iomega Zip Drive
- U.S. Robotics 56Kbps Data/Fax/Voice Modem
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to 7.0GB Ultra DMA Hard Drive, add \$109
- * Upgrade to 64MB SDRAM, add \$239

\$2699

Business Lease: \$97/mo.

Direction SPT233

- 233MHz Pentium processor with MMX technology/512KB L2 Pipeline Burst Cache
- 3.2GB Ultra DMA Hard Drive/32MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-45 Speakers/Integrated Yamaha Sound
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to Altec ACS-410 Speakers with ACS-251 Subwoofer, add \$69
- * U.S. Robotics 56Kbps Data/Fax/Voice Modem, add \$119

\$2399

Business Lease: \$86/mo.

Direction SPT233

- 233MHz Pentium processor with MMX technology/512KB L2 Pipeline Burst Cache
- 4.3GB Ultra DMA Hard Drive/32MB SDRAM
- 4MB SGRAM PCI Graphics Card
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- NEC 15" Monitor (14" v.i.s.)
- * Upgrade to NEC 17" Monitor (16" v.i.s.) add \$199
- * Upgrade to AWE32 Wavetable Audio, add \$49

\$1999

Business Lease: \$72/mo.

To order, get a free catalog or
find your nearest reseller call
Mon-Fri 9am-5pm EST

1-888-8-NEC-NOW
Ext. No. PM524A www.necnow.com

NEC

NEC Versa 2700 Series *All-in-one convenience at a sensible price.*

Common Features: PCI Bus with 128-bit Graphics Accelerator • 256KB L2 Pipeline Burst Cache • 32-bit CardBus Support • 2MB VRAM • USB Port • 56Kbps* Integrated Modem • Stereo Speakers and Subwoofer with 3D Stereo Sound • Upgradeable 1-Year Limited Warranty

Versa 2760MT

- 166MHz Pentium® processor with MMX™ technology
- 12.1" SVGA Active Matrix TFT Color Display
- 16MB RAM
- Built-in 2.1GB Hard Drive, 16X max CD-ROM, 1.44MB Floppy Drive, and Lithium Ion Battery
- * Upgrade to 80MB RAM, add \$699
- * Optional Lithium Ion Battery, add \$199
- * Optional NEC Versa PortBar™ 2700 Port Replicator, add \$159

\$3299

Business Lease: \$119/mo.

Versa 2730MT

- 133MHz Pentium processor with MMX technology
- 12.1" SVGA Active Matrix TFT Color Display
- 16MB RAM
- Built-in 1.44GB Hard Drive, 16X max CD-ROM, 1.44MB Floppy Drive, and NiMH Battery
- * Upgrade to 48MB RAM, add \$299
- * Optional NEC Xircom 10Base-T Network PC Card, add \$139
- * Optional VersaNote™ Ballistic Nylon Carrying Case, add \$69

\$2899

Business Lease: \$104/mo

NEC Direction PCs *A new direction in cutting edge technology*

Common Features: Mini-Tower or Desktop Tool-Less Chassis • 24X max CD-ROM • 3.5" Floppy Drive • MS® Office 97 SBE • 2 USB Ports • Microphone • Palmrest Keyboard and MS IntelliMouse® • 3-Year Limited Warranty with 1-Year On-Site Service

Direction SPL266

- 266MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 9.0GB SCSI Hard Drive/64MB SDRAM
- Adaptec 2940UW SCSI Controller
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- Iomega Zip Drive
- NEC 17" Monitor (16" v.i.s.)
- MS Windows NT 4.0
- * Upgrade to 128MB SDRAM, add \$469
- * Upgrade Video Memory to 8MB WRAM, add \$119

\$4199

Business Lease: \$147/mo.

Direction SPL233

- 233MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 4.3GB Hard Drive/32MB SDRAM
- Number Nine Reality 334, 4MB SGRAM
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- NEC 17" Monitor (16" v.i.s.)
- MS Windows 95
- * Upgrade to 7.0GB Hard Drive, add \$109
- * Upgrade to Number Nine Revolution 3D, 4MB WRAM, add \$219

\$2399

Business Lease: \$86/mo.

NEC Express5800™ Series Servers *Server that grows with your business*

Common Features: Integrated PCI Wide Ultra SCSI Disk Controller • Integrated PCI SCSI Controller for Media Bays • Integrated SVGA Controller • 1MB VRAM (upgradeable to 2MB) • 12X CD-ROM • 3.5" Floppy Drive • 10/100 PCI Network Adapter • Mouse and Keyboard • NEC ESM™ Pro Server Management Software • MS Windows NT Server 4.0 and NetWare® 4.11 Certified • 3-Year On-site Service Warranty

Express5800 MT2000

- Dual Capable Pentium Pro System w/ one 200MHz Pentium Pro processor/256KB Integrated L2 Cache
- 64MB ECC Memory (1GB Maximum)
- 8 Expansion Slots, 4 PCI, 3 EISA, 1 Shared
- 11 Available Bays, 6 Hot-swappable, 3 x 5.25" & 2 x 3.5" External
- One Hot-swap 4GB Wide Ultra SCSI Disk, 7200RPM
- * Optional Hot-swappable Redundant Power Supplies, add \$599
- * Optional Second 200MHz/256KB Pentium Pro processor, add \$799
- * Additional 64MB of ECC Memory, add \$449
- * PCI Wide Ultra SCSI RAID Controller, add \$1349
- * 2/4/9GB Wide Ultra SCSI Disk Drives for up to 54GB of Storage Space, add \$599/\$899/\$1499

\$5699

Business Lease: \$199/mo.

Express5800 LE2000

- Dual Capable Pentium Pro System w/ one 200MHz Pentium Pro processor/256KB Integrated L2 Cache
- 32MB ECC Memory (1GB Maximum)
- 8 Expansion Slots, 4 PCI, 3 ISA, 1 Shared
- 7 Drive Bays, 3 External 5.25", 4 Internal 3.5"
- One 4GB Wide Ultra SCSI Disk, 7200RPM
- * Optional Second 200MHz/256KB Pentium Pro processor, add \$799
- * Additional 32MB of ECC Memory, add \$189
- * PCI Wide Ultra SCSI RAID Controller, add \$1349
- * 2/4GB Wide Ultra SCSI Disk Drives for up to 36GB of Storage Space, add \$529/\$849

\$3499

Business Lease: \$126/mo.



To order, get a free catalog or find your nearest reseller call: **1-888-8-NEC-NOW**
Mon-Fri 9am-5pm EST

1-888-8-NEC-NOW

Dept. No. PM524A www.necnow.com

CIRCLE 196 ON READER SERVICE CARD

NEC

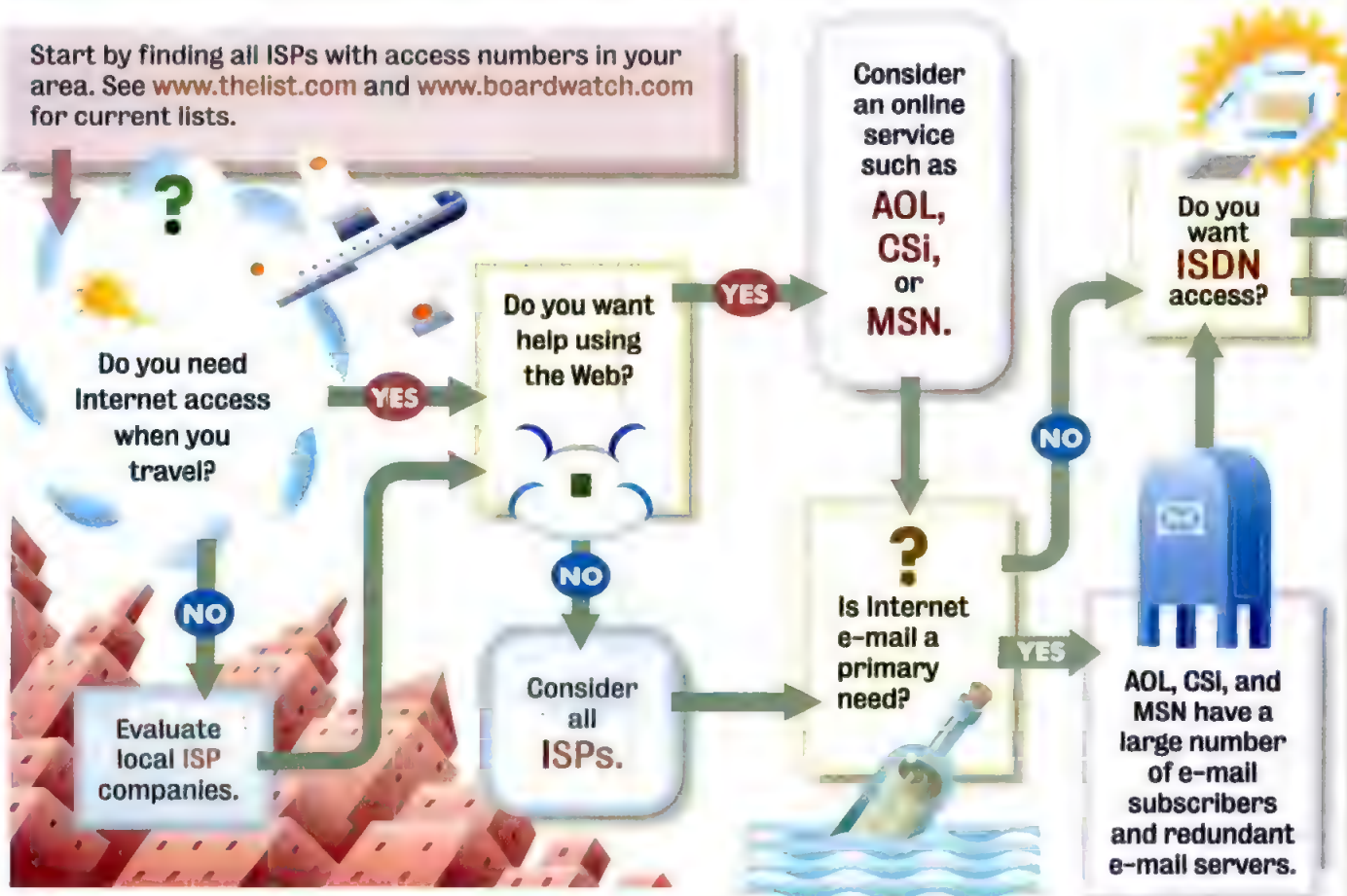
Choosing Your ISP

ISPs vary greatly in performance, features, pricing, and coverage. Use this guide to make the best choice.

By Leon Erlanger

There are lots of factors to consider when choosing the best ISP for your needs. First, of course, you must find out which ISPs offer telephone numbers in your area. The availability of local numbers in many additional areas is also important if you travel or have operations in multiple locations. And inexpensive toll-free access is important if you think you'll need to go online from lo-

cations that aren't covered by the ISP's local-access telephone numbers. After availability, there are other issues that will influence your decision, such as performance and reliability, Web-site-hosting options, and pricing. This *PC Magazine* guide to choosing your ISP provides you with a structured decision process and questions to help you evaluate and decide. We also provide a collec-





COMPUSERVE INTERACTIVE

Reviewers' ratings:	Good-Excellent
Test results from Inverse:	Good
User survey results:	N/A

Although we did not receive enough responses from CompuServe users to judge user satisfaction adequately, both Inverse and our reviewers found the service reliable. This provider has a time-proven and reliable e-mail system, excellent Web hosting, and many U.S. points of presence. It has no flat rate for unlimited access. CompuServe is a good choice, but it could be expensive if you spend a lot of time on the Web. 800-848-8990; www.compuserve.com.



CONCENTRIC NETWORKS

Reviewers' ratings:	Fair-Excellent
Test results from Inverse:	Fair
User survey results:	Good

Concentric seems to be anything but symmetrical. *PC Magazine's* reviewers were impressed with the Web-site-hosting options, but not with the e-mail and newsgroup services. Inverse reported good reliability for Concentric but only a fair throughput rate. The users like the technical support and were generally satisfied with the service. If Concentric is available where you live, it's worth a look. 800-745-2747; www.concentric.net.



THE MICROSOFT NETWORK

Reviewers' ratings:	Fair-Poor
Test results from Inverse:	Good
User survey results:	N/A

We didn't receive enough responses to our e-mail survey to judge user satisfaction. While Inverse observed good to excellent performance, our reviewers didn't like Microsoft's abandonment of Windows 3.1 users or its lack of features compared with other services. We think there are better alternatives. 800-373-3676; www.msn.com



MCI INTERNET

Reviewers' ratings:	Fair
Test results from Inverse:	Fair
User survey results:	Good

Considering that MCI has huge backbone pipes, we found the *fair* ratings on throughput and reliability disappointing. While our reviewers weren't impressed with the service, the users who responded to us expressed strong loyalty. But like AT&T, MCI doesn't offer ISDN. Maybe you'll like this service, but it's not our first choice. 800-550-0927; www.mci.com.



SPRINT INTERNET PASSPORT

Reviewers' ratings:	Fair-Good
Test results from Inverse:	Good
User survey results:	Good

Another major Internet backbone provider, Sprint scored well on Inverse's throughput and reliability ratings. Sprint doesn't have a huge number of dial-in points, nor does it let you post personal Web pages. But users with local access are highly satisfied. This is a good choice, particularly if Sprint gets rid of the \$5 monthly surcharge for 56-Kbps access. 800-747-9428; www.sprint.com.



SPRYNET

Reviewers' ratings:	Fair-Good
Test results from Inverse:	N/A
User survey results:	Good

Inverse doesn't rate Sprynet, but *PC Magazine's* reviewers and our surveyed users were only moderately impressed. The company has a lot of access numbers, and it offers ISDN access. You get a great deal of storage space for Web pages, and a few extra features. Sprynet is a good bet if you're counting on nationwide access. 800-777-9638; www.sprynet.com

Test Your ISP

By Frank J. Derfler, Jr.

Do you find Web surfing to be agonizingly slow? There are programs that can help you determine where the bottleneck lies: in the connection to your ISP, your ISP's link to the Internet backbone, or your PC's own processor or memory.

You can start bottleneck busting with the simple TRACERT.EXE program found in Windows. This DOS command line utility uses IP to trace the route to an IP address. It reports the number of router hops, the time for each hop, and any failed attempts to cross a hop. The hop count and time information don't mean much by themselves, but if you can compare ISPs or even compare your own ISP on different days, you start to build a profile. If you see a lot of failed attempts, it's time to consider switching Internet access providers.

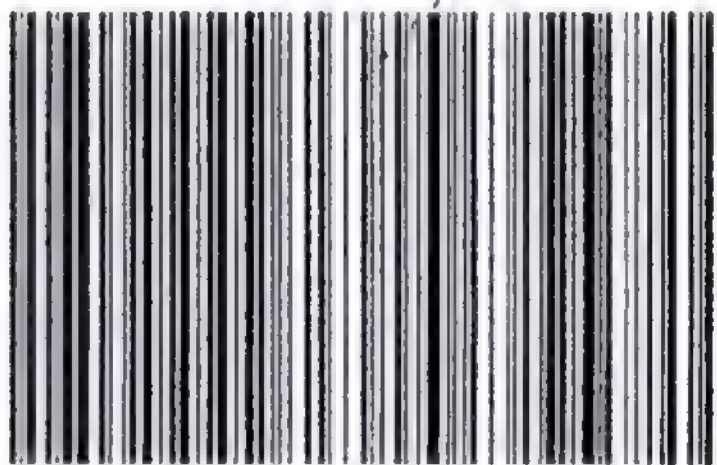
Building a profile is the job of two other interesting utilities: Know-It ServerTrak is \$99 for commercial sites, \$79 for nonprofit sites; a free trial version is available at www.know-it.com or, together with several similar utilities, at www.tucows.com. Net.Medic, from Vital Signs Software, is \$49.95; a free trial version is available at www.vitalsigns.com. As its name implies, ServerTrak is aimed at Web server URLs. At intervals you specify, it sends requests to your URL list, monitors the responses, and alerts you to responses that don't meet your preselected criteria for time or throughput. You can use ServerTrak to track your own Web facilities as well, getting an end-to-end check of your corporate intranet or Internet service provider.

If you really want to understand what's going on over your IP connections, then you need Net.Medic on your screen. You'll grow to love Net.Medic, because it gets smarter as it goes along. The program learns about your ISP, your computer, and the state of the network from your desktop perspective. You need several hours of online operation before the utility can make judgment calls, but then it can diagnose malfunctioning routers along the path, report the health of your computer, ISP, or favorite Web site, and provide you with fascinating graphs showing throughput in various parts of the system. It's interesting to use Net.Medic to see what happens when modem compression kicks in or to measure the effect of a faster link to the ISP. □

1. Follow instructions on the other side

Back

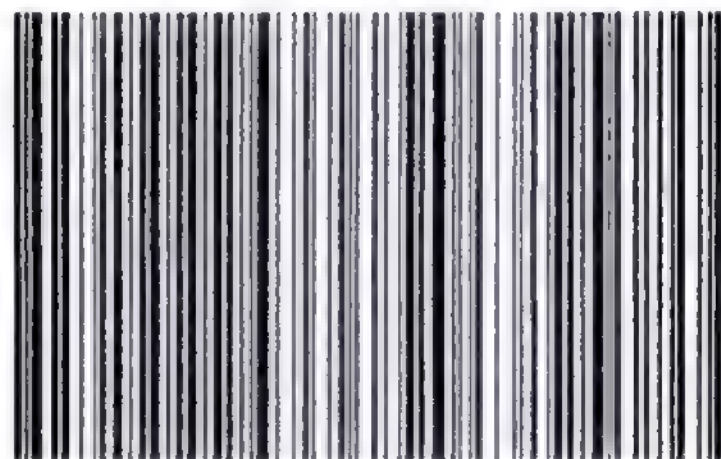
GbsSlipBack-0018



Inverted Back

1. Follow instructions on the other side

Folded edge of the page



Inverted Foldout slip-sheet

Foldout slip-sheet



1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
 3. Slice the folded edge
 4. Close the page and slip-sheet

1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
 3. Slice the folded edge
 4. Close the page and slip-sheet



Internet Service Provider Summaries



We used a variety of sources to create the ratings and summaries you see on these two pages.

• **Reviewers' ratings.** Our editorial and PC Magazine Labs staffs spent many hours online with each service, focusing on the installation and configuration of each ISP's software, the support provided for e-mail and newsgroups, and the Web hosting services.

• **Test results from Inverse.** We enlisted the help of Inverse Network Technology (www.inversenet.com), a firm that measures and reports ISP performance by making more than 60,000 phone calls to 12 of our 13 national providers over a two-week period. We took Inverse's results for a series of performance-related statistics, including the important reports of connection failures and the frequency of disconnections during a session, and created performance ratings for each ISP.

• **User survey results.** We sent an informal multiple-choice e-mail survey to hundreds of users, asking them to rate their satisfaction with the performance, e-mail, and technical support their ISPs provide. To be included in our results a service was required to receive 30 or more user replies.



AMERICA ONLINE

Reviewers' ratings:	Fair-Good
Test results from Inverse:	Poor
User survey results:	Adequate-Good

Our reviewers liked AOL's ease of use and extended services. But Inverse gave it poor ratings for call success and throughput. And the users surveyed also noted performance problems. AOL, however, continues to upgrade its backbone network in order to improve connectivity. You'll appreciate AOL's easy installation and hot newsgroup and e-mail activity—if you can stand its heavy dose of advertising. 800-827-6364; www.aol.com.



AT&T WORLDNET SERVICE

Reviewers' ratings:	Fair-Good
Test results from Inverse:	Good
User survey results:	Good

The AT&T users who responded to our e-mail survey and Inverse concur on the solid reliability of AT&T's service. Our reviewers were slightly less enthusiastic about the e-mail and Web server host offerings. AT&T is not aggressive about providing dial-up services faster than 28.8 Kbps. This is a decent choice if you require only one e-mail account and you're willing to pay a monthly fee to post your Web site. 800-967-5363; www.att.com/worldnet.



EARTHLINK NETWORK

Reviewers' ratings:	Fair-Excellent
Test results from Inverse:	Good-Excellent
User survey results:	Good

The EarthLink users surveyed were generally very satisfied, probably because of the excellent throughput that Inverse discovered. EarthLink reported the largest number of available dial-in points in the U.S., although the company has a \$4.95-per-hour premium on 56-Kbps service, which a few others offer for free. EarthLink is an excellent bet both for a good connection and for hosting a personal Web site. An Editors' Choice. 800-395-8425; www.earthlink.net.



IBM INTERNET CONNECT

Reviewers' ratings:	Fair
Test results from Inverse:	Good-Excellent
User survey results:	Good-Very Good

Reliability and throughput rule users' hearts, but reviewers are more fickle. *PC Magazine* reviewers weren't impressed with IBM's unusual installation or lack of personal-Web page services, but Inverse measured excellent throughput and reliability. IBM offers ISDN, leased lines, and practically any combination of services—including free 56-Kbps connections. Users are unusually loyal to IBM, and you might be, too. 800-821-4612; www.ibm.net.



MINDSPRING

Reviewers' ratings:	Good
Test results from Inverse:	Poor
User survey results:	Good-Very Good

PC Magazine's reviewers and surveyed users think you get a good deal with MindSpring. On the other hand, Inverse saw mixed results, perhaps reflecting MindSpring's acquisition of PSINet. MindSpring offers ISDN and 56-Kbps access. It's worth investigating whether MindSpring has a significant number of dial-in numbers near you. MindSpring is a steal if you want to host a personal Web site with lots of data. 800-719-4660; www.mindspring.com.



NETCOMPLETE

Reviewers' ratings:	Fair-Good
Test results from Inverse:	Good-Excellent
User survey results:	Adequate-Good

Netcom is a big and experienced ISP, and Netcomplete is a competent service that offers both ISDN and leased-line connections. Netcomplete offers a good number of dial-up access points, too. Inverse reports excellent reliability, and we think Netcomplete does a decent job as a professional service without frills. 800-638-2661; www.netcom.com.



PRODIGY INTERNET

Reviewers' ratings:	Good-Excellent
Test results from Inverse:	Good
User survey results:	N/A

Although we didn't receive enough responses to our e-mail survey to get an adequate impression of user satisfaction, this online service seems to offer a great deal of value: easy configuration, many connection points, and excellent throughput and reliability. Okay, there's no ISDN service, but Prodigy does offer 56-Kbps connections without any surcharge. An Editors' Choice. 800-776-3449; www.prodigy.com.

tion of objective and subjective measurements of the 13 ISPs we examine in the current roundup.

Use this gatefold to narrow down your list of possibilities. Then go to the reviews in the main story to get further information on each of your candidates. If you want more detail on test results and the results of our user-satisfaction e-mail survey, see "ISP Test and Survey Results" in this issue. Choose carefully because, although you can change your mind, changing software, phone numbers, and e-mail addresses can be a hassle.

This gatefold contains the following elements.

- **ISP Decision Tree.** Below we present a step-by-step method for narrowing down your list of candidates. It covers most of the issues you'll want to consider, such as local access numbers, high-speed access, e-mail, and Web hosting.

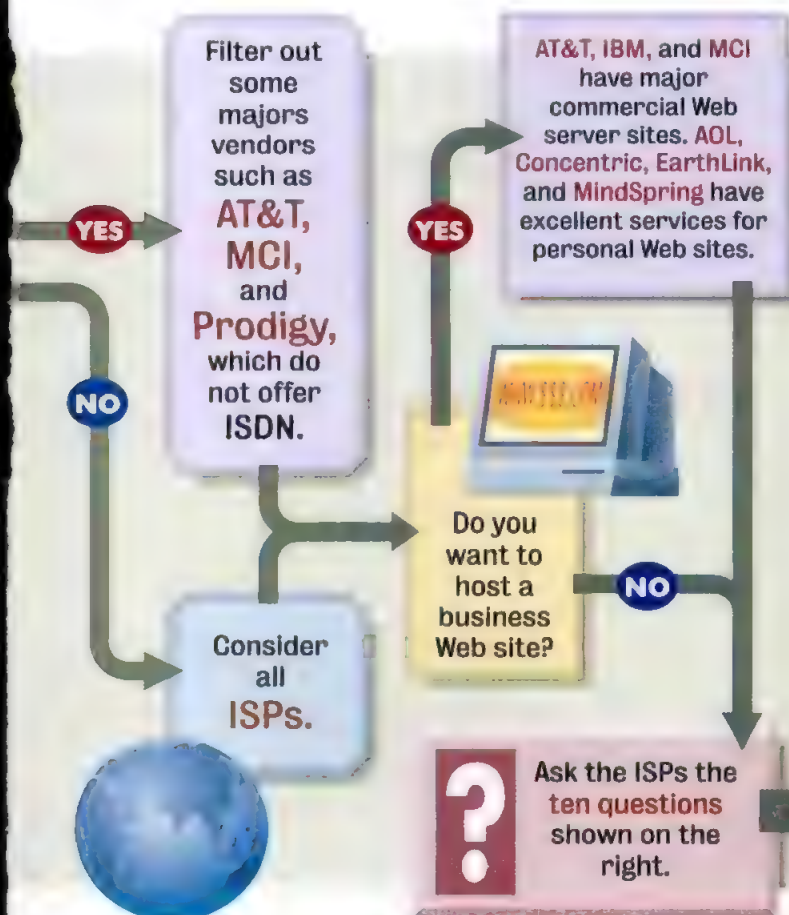
- **Ten Questions to Ask Your ISP.** This is a cheat sheet of questions you can use when you call the customer-service number of each of your candidates or visit its Web site. You can also keep this sheet handy when you're reading our reviews or scanning the Summary of Features.

If you don't have a fast modem or have no inten-

tion of posting a Web site, then you may think you're not interested in the answers to all these questions. But there's a very good chance your needs will grow as you continue to surf. Answering these questions today will help you avoid the hassle of having to change ISPs—and therefore your software and e-mail addresses—in the future.

- **ISP Guides.** Look on the third and fourth pages of this gatefold for individual summaries for all of the national ISPs covered in this roundup. Here we condense all the information presented in the reviews, the Suitability to Task ratings, the performance test scores, and the results of our informal e-mail survey of user satisfaction into digestible abstracts to help you make a quick decision. (For more information on test results, remember to consult the sidebar "ISP Test and Survey Results" in the feature story "More Speed in the Pipeline.")

- **Test Your ISP.** If you're dissatisfied with the performance you're getting when you go online and you're thinking of switching ISPs, check out this sidebar first. It describes some interesting utilities you can use to figure out where the problem really lies—with your ISP, the Internet, or your own PC.



TEN QUESTIONS TO ASK YOUR ISP

1. Do you have telephone-access numbers in my local calling area?
2. Do you offer toll-free phone access in case I am on the road and not near a point of presence? How much extra do you charge for this service?
3. Do you have a fixed monthly price for unlimited use? What is it?
4. Which browser and e-mail reader do you provide?
5. Can I use another browser and e-mail reader (either POP3 or IMAP4) of my own choosing?
6. Do you offer more than one e-mail account per subscription? How many?
7. Do you offer 56-Kbps access? Do you charge a premium?
8. Is your 56-Kbps access based on the x2 or K56flex standard, and will it work with my 56-Kbps modem?
9. Do you offer free Web-page postings? How many megabytes of server space do I get?
10. Do you offer wizards or other software to help me set up a home page?



Extra Hot.

Call now to order.
800-776-4512
www.micronpc.com



CONFIGURED FOR YOUR LIFE



Spice things up with Micron TransPorts.TM

Taste test our TransPort V1X notebook. It's small and sleek—but has some real bite. It fits the bill if you're looking for a racy little portable for home, office or travel. And, our V1X features flexibility and a great design—all for a more-than-palatable price.

Best of all, when you buy Micron, you cook up your own computer—custom-configured to meet your needs. Because we like things homemade, not mass-produced. You also get the top-notch customer service and support that's made us famous. And, we back you up with one of the best warranties in the business—from one of the best companies in the business.

Now that's hot stuff.

MICRON MILLENNIA Mini P200

Intel 200MHz Pentium processor with MMX technology
48MB SDRAM
4GB EIDE hard drive
17" Micron 700FGx, 26dp (16.0" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
3.5" floppy drive
100MB Iomega Zip drive
16X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound with speakers
US Robotics Sportster 56K x2 internal data fm/modem™
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDE
Multimedia Excitement Pak
(comprised of MMX technology-based software)
Universal Serial Bus connections
5-year/3-year Micron Power limited warranty

\$2,299

Bus. Inno \$28/mon.

MICRON MILLENNIA Lite P166

Intel 166MHz Pentium processor with MMX technology
16MB EDO RAM
2.1GB EIDE hard drive
15" Micron 500FGx, 26dp (13.7" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
3.5" floppy drive
16X EIDE variable speed CD-ROM drive
16-bit stereo sound and speakers
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Tool-free minitower or desktop
Microsoft Mouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Works CD
Universal Serial Bus connectors
5-year/3-year Micron Power limited warranty

\$1,499

Bus. Inno \$52/mon.

MICRON TRANSPORT V1X

133MHz Intel Pentium processor
16MB EDO RAM (40MB max.)
1.4GB hard drive
16X modular CD-ROM drive
Li-Ion battery
12.1" TFT SVGA, 800x600 display

STANDARD FEATURES

256KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator
MPEG compatible
Zoomed video-ready
Touchpad pointing device
16-bit stereo sound
Built-in stereo speakers and microphone
2-way infrared port
Modular floppy drive (flexible bay swappable with optional CD-ROM)
Microsoft Windows 95 and MS Plus!
5-year/1-year Micron limited warranty

\$2,499

Bus. Inno \$85/mon.

Call now to order.
800-776-4512
www.micronpc.com



CONFIGURED FOR YOUR LIFE



The Micron™ Millennia™ series puts some kick into computing.

It's time to turn up the heat.

Check out our Millennia series. It's been adding real spice to personal computing for a long time, but we keep making things even hotter.

Now, our Millennia line includes models with Fusion 3D™ for those ready to dish up computer entertainment – like graphics-heavy games or video-packed Internet sites. Our Millennia XRU packs some heat with its Pentium® II processor, while our MME models feature Pentium processors. Either way, you can muster up MMX™ technology, 3D video, MPEG and 24X EIDE CD-ROM, and more – so these desktops promise speed, performance and easy upgrades.

MICRON MILLENNIA XRU WITH FUSION 3D

Intel 266MHz Pentium II processor (features MMX technology)
64MB EDO RAM
6.4GB EIDE hard drive
19" Hitachi SuperScan CMT51, 256p (16" display)

STANDARD FEATURES

512KB internal L2 cache, 2MB BIOS
Diamond Stealth Pro DX 3D video, MPEG, 4MB EDO RAM
Monster 3D graphics card with 4MB memory
3.5" floppy drive, 100MB Iomega Zip drive
DVD-ROM drive, DVD software, E4 Cool DVD PCI decoder card:
6 channel AC-3 to 2 channel out capability,
SPDIF output (digital audio out)
US Robotics Sportster 56K x2 internal data fax/modem**
Awe 64 sound card
Cambridge SoundWorks/MicroWorks-
2 speaker satellite with subwoofer stereo system
Tool-free minitower or desktop
Fusion 3D game pack - Mech Warrior2: Mercenaries 3Dfx version,
Ali-640 Longbow, U.S. Navy Fighters '97, Command & Conquer,
Popular 3Dfx Racing Sim
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
Universal Serial Bus connections
MS Sidewinder Pro joystick
5-yr/3-yr Micron Power™ limited warranty

\$3,999

Int. base \$136/m.

MICRON MILLENNIA MME WITH FUSION 3D

Intel 233MHz Pentium® processor with MMX™ technology
48MB SDRAM
4GB Ultra ATA hard drive
17" Micron 700FGx, 256p (16.0" display)

STANDARD FEATURES

512KB pipeline burst cache, flash BIOS
Diamond Stealth Pro DX 3D video, MPEG, 4MB EDO RAM
Monster 3D graphics card with 4MB memory
3.5" floppy drive
100MB Iomega Zip drive
24X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound
Advent 370's - speaker/subwoofer system
US Robotics Sportster 56K x2 internal data fax/modem**
Tool-free minitower or desktop
Fusion 3D game pack - Mech Warrior2: Mercenaries 3Dfx version,
Ali-640 Longbow, U.S. Navy Fighters '97, Command & Conquer,
Popular 3Dfx Racing Sim
Microsoft Intellimouse™, 104-key keyboard
Microsoft Windows® 95 and MS® Plus! CD
Microsoft Office 97 SBE CDs
Universal Serial Bus connections
MS Sidewinder Pro joystick
5-year/3-year Micron Power limited warranty

\$2,799

Int. base \$85/m.

MICRON MILLENNIA XRU

Intel 233MHz Pentium II processor (features MMX technology)
48MB EDO RAM
4GB EIDE hard drive
17" Micron 700FGx, 256p (16.0" display)

STANDARD FEATURES

512KB internal L2 cache, 2MB BIOS
3.5" floppy drive
100MB Iomega Zip drive
24X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound with speakers
US Robotics Sportster 56K x2 internal data fax/modem**
PCI 64-bit 3D video, MPEG, 4MB EDO RAM
Tool-free minitower or desktop
Microsoft Intellimouse, 104-key keyboard
Microsoft Windows 95 and MS Plus! CD
Microsoft Office 97 SBE CDs
Multimedia Xcitement Pak
(comprised of MMX technology-based software)
5-year/3-year Micron Power limited warranty

\$2,699

Int. base \$82/m.

*The CD-ROM drive will be removed upon the purchase of the DVD upgrade.

**Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and observed transfer rates may be less than the maximum potentials.



MULTIMEDIA OPTIONS

32 voice wavetable stereo sound card	\$59
32 voice wavetable stereo sound card with 2MB RAM	\$99
Advent AW270 Powered Partners stereo speakers	\$79
Advent AW370 Powered Partners stereo speakers with subwoofer	\$199
Microsoft® SideWinder 3D Pro joystick	\$59
Microsoft SideWinder gamepad	\$39

STORAGE/MEDIA OPTIONS

Adaptec 2940U Ultra SCSI Fast-20 controller	\$100
upgrade from system with standard Ultra SCSI Fast-20 controller	
Plextor 12/20 Plex 3MB/sec SCSI internal CD-ROM drive	\$100
upgrade from system with standard EIDE CD-ROM drive	
Imomega Jaz SCSI drive with 1GB removable cartridge	\$299
Imomega ZIP IDE drive with 100MB removable cartridge	\$99
Imomega 6-pack of 100MB Zip cartridges	\$99
Imomega Ditto 2000 (1/2GB)	
Travan tape backup drive with tape	\$149
Imomega Ditto 3200 (1.6/3.2GB)	
Travan tape backup drive with tape	\$199
Sony 4/8GB SCSI DDS-2 tape backup drive with tape and software	\$899

COMMUNICATION OPTIONS

33.6 internal data/fax modem	\$99
33.6 internal data/fax modem, speakerphone, voice mail	\$119
33.6 external data/fax modem	\$299
56Kbps technology modem*	\$99

SOFTWARE OPTIONS

Adventure Pak: Sheila Rae the Brave, Putt-Putt Saves the Zoo, Reader Rabbit's Reading Development Library 1, Freddie Fish and the Case of the Missing Kelp Seeds, and the Thinkin' Things Collections 2"	\$69
Quicken Financial Pak: Quicken Deluxe, Quicken Financial Planner, Quicken Parents' Guide to Money, Quicken Family Lawyer"	\$69
CorelDRAW 7 full retail version	\$299
Corel WebMaster Suite full retail version	\$99

NOTEBOOK EXTENDED SERVICE OPTIONS (Viz only)

2nd and 3rd year parts and labor; 3-business-day turnaround for 3 years	\$269
2nd and 3rd year parts and labor; 7-business-day turnaround for 3 years	\$209

DISPLN/VIDEO OPTIONS

17" Hitachi SuperScan CM630 (15.9" display) .26dp color monitor	\$150
19" Hitachi SuperScan CM75L (18" display) .26dp color monitor	\$350
21" Hitachi SuperScan CM80L (20.0" display) .26dp color monitor	\$650
Number Nine Imagine 128 series II video card, 4MB VRAM	\$299
Number Nine Imagine 128 series II video card, 8MB VRAM	\$549

SCANNER OPTIONS

HP Scanjet 5s sheetfed scanner	\$269
HP Scanjet 5p flatbed scanner	\$399
HP Scanjet 4c flatbed scanner	\$799

TRANSPORT OPTIONS

Motorola Montana 33.6 fax/modem supports regular telephone connections, cellular phones and two-way paging devices	\$259
--	-------

DESKTOP EXTENDED SERVICE OPTIONS

Optional 1st year on-site service* coverage included	
2nd year on-site service* coverage	\$79
2nd and 3rd year on-site service* coverage	\$99

Other service options may be available, ask your system consultant

HP PRINTERS

HP DeskJet 692c printer	\$319
HP DeskJet 870Cxi printer	\$419
HP LaserJet 6Lxi printer	\$429
HP LaserJet 6P printer	\$799

OTHER OPTIONS

APC PerTt surge suppressor	\$39
APC ProTt surge suppressor	\$59
Microsoft Natural Keyboard (upgrade from standard keyboard)	\$49

Upgrade from systems with standard 16-bit stereo sound card
 Requires SCSI host adapter
 Requires sound card
 Upgrade from systems with standard Micron 17" 700Hz (16" display) color monitor
 Upgrade from systems with standard 14-bit 1MB video card
 1st year on-site service is available in the United States and is limited to service in Canada from third-party service provider per customer's agreement with provider
 2nd year and 2nd and 3rd year offerings are available in the United States only. Estimated service, if purchased after system shipment may have a higher cost.
 Service will be extended, whenever possible, for the next business day after parts are received by the customer.
 Available in certain locations, ask your system consultant for details.
 Some options and accessories available with system purchase only

*Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and observed transfer rates may be less than the maximum potentials.

*Available only on desktop and notebook systems with Microsoft Windows 95.

MICRON POWER™ WARRANTY

5-year limited warranty on microprocessor and main memory
 3-year limited parts only system warranty (1 year for TransPort V.1)
 1, 2, or 3-year optional on-site service agreement for Micron desktop and server systems
 30 days of free Micron-supplied software support for Micron desktop systems; 3 optional network operating system incident resolutions included for Micron server systems
 30-day money back policy
 24-hour technical support

The foregoing is subject to and qualified by Micron's standard limited warranties and terms and conditions of sale. Terms and conditions of sale may vary for specific configurations. Copies of the limited warranties may be obtained on our Web site or by calling Micron.



Designed for
 Micron Sales Hrs: Mon-Fri 6am-10pm,
 Sat 7am-5pm (MT) Technical Support
 Available 24 Hours A Day, 7 Days A Week
 Toll free from Mexico: 95-800-708-1755
 Toll free from Canada: 800-708-1758 • Toll free from
 Puerto Rico: 800-708-1756 • International Sales:
 208-893-8970 • International Fax: 208-893-7393

Call now to order.
 800-776-4512
 www.micronpc.com



CIRCLE 119 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

©1997 Micron Electronics, Inc. All rights reserved. Micron Electronics is not responsible for omissions or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice; prices do not include shipping and handling and any applicable taxes. 30-day money-back policy does not include return freight and original shipping/handling charges, applies only to Micron brand products and begins from date of shipment. All sales are subject to Micron Electronics' current terms and conditions of sale. Lease prices based on 36-month lease. The Intel Inside Logo and Pentium are registered trademarks of Intel Corporation. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies.

CONFIGURED FOR YOUR LIFE

sent between AOL and Internet mail recipients intact. Conveniently, AOL also gives you up to five separate mail accounts for each paid subscription.

We tested AOL with its 3.0 software and standard-installation CD and found that it was one of the easiest products to install. The installation process clearly demonstrates some of the advantages of a proprietary package. After registration, AOL's software knew to download an updated version of AOL for Windows. Since AOL comes with its own browser, e-mail, and news clients, you don't need a third-party browser such as Netscape Navigator, as you would with most of the products that deliver only Internet services.

For users interested in 56-Kbps access, AOL offered a limited-trial number for nine metropolitan regions at press time. AOL is testing U.S. Robotics' x2-compatible modems and has announced testing of the Rockwell K56flex standard. It also offers access via ISDN and leased lines.

In case you want to host a Web site on AOL, your account comes with 2MB of free server space (per screen name). AOL includes an online tool called Personal Publisher and additionally offers AOLpress, which received an honorable mention in our roundup of Web-site creation packages ("Grand Designs," March 4, 1997).

AOL continues to be the universal online service and ISP. It's still a reminder that there's value in providing original content rather than in relying on whatever the Internet democracy decides to host. AOL is clearly the closest thing to an online and ISP appliance available today.—TP

CompuServe Inc.

CompuServe Interactive

After 18 years in the online business, CompuServe is still chugging along. Its revamped online service, now known as CompuServe Interactive (CSI), continues to offer top-notch proprietary content, including business forums, health information, and weather forecasts through a completely redesigned interface. CSI also

provides e-mail, Web, and newsgroup access. But there is no high-speed connectivity available for consumer accounts today. CSI achieved good results on Inverse's performance tests. Unfortunately, we did not receive enough responses to our informal e-mail survey to gauge user satisfaction. CSI was also the most expensive Internet provider we reviewed.

CompuServe Interactive shares the

itself is simple but gets the job done.

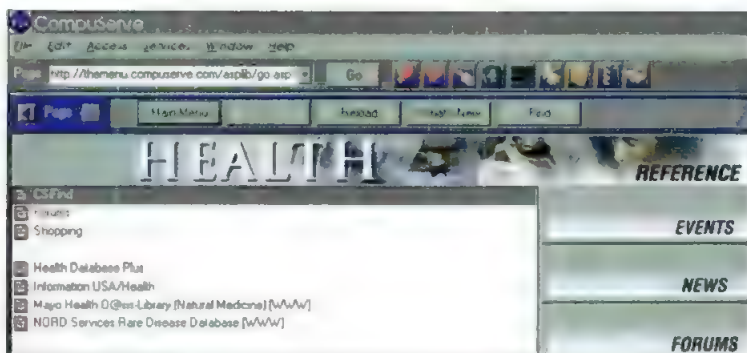
One of the biggest upgrades to CSI has been in the area of e-mail. CSI now supports personal address names (*pboyle@compuserve.com*) instead of its former complicated numbering scheme (1776.123@compuserve.com). The trick is to get your name in before someone else takes it. Even more exciting than personal addressing is support for multipurpose Internet mail extensions (MIME), the Internet standard for sending e-mail file attachments over the Internet to other mail systems. Until recently, it was only possible to send binary attachments to other CSI members.

Other features available for mail users are Smart Rules and the CompuServe Communication Card. For \$9.95 per month, Smart Rules allows up to

100 mail messages to be forwarded to a pager; each message over 100 costs an additional \$0.10. Meanwhile, the CompuServe Communication Card allows you to retrieve your e-mail via phone for \$0.25 per minute, with an additional \$0.50 for the first minute on a long-distance call. In the future, CSI also plans to add POP3 support for e-mail. The one drawback to CSI's mail access is that, as with most of the Internet-only services in this roundup, you get only one mailbox per account.

In addition, CSI provides a generous 5MB of storage for your own Web page and offers a home-page wizard that walks the novice through the page-creation process. CompuServe also offers some useful HTML information, tips, and tools as part of its online content to assist the novice. And other pricing packages exist for small companies that want additional Web-site space.

Currently, CSI does support ISDN access through CompuServe Network Services and U.S. Robotics' x2-compatible modem technology. It provides an excellent mix of online content and Internet access. But you have to decide for yourself if the proprietary content is worth the few extra dollars per month over the price you'd pay to a typical ISP.—Padraic Boyle



CompuServe Interactive does a good job of organizing both Web and proprietary content into easy-to-use categories.

same points of presence and backbone network as its sister service, SpryNet. Its focus and pricing plans are different, however. Unlike the other services reviewed here, CSI does not offer an unlimited-access plan. Two plans are available to accommodate both light and heavy users. For \$9.95 per month, CSI offers 5 hours of connect time and \$2.95 per hour thereafter. For \$24.95 per month, you get 20 hours of connect time and \$1.95 per hour thereafter. Toll-free access is available for a \$6-per-hour surcharge.

Installing and configuring CSI was fairly simple. Similar to America Online and The Microsoft Network, this service requires a large amount of storage space—over 50MB—to store the graphics for CompuServe Interactive 3.0's handsome GUI. In addition, it includes a copy of Microsoft Internet Explorer for Web browsing, accessible through the proprietary interface. But you must still access your e-mail via CSI's proprietary mail client—no other software can be substituted, since it's not POP3-compliant. But it does allow you to read and write e-mail off-line.

CSI continues to block access to newsgroups with objectionable content, a feature that has pleased many parents but remains controversial. The news reader

It does things computers weren't able to do back in 1997.

Introducing NEC Direction™ PCs.

The latest in cutting edge technology from NEC.

The new Direction PC from NEC isn't merely ahead of most computers. It's ahead of its time. In fact, it represents the next phase in the PC evolution. Which isn't surprising when you consider that NEC introduced the first color laptop and the first workgroup servers with redundant hot-swap power, disks and fans.

Why NEC NOW?

- The security of partnering with a company known for its technological innovations.
- The flexibility of ordering direct or through a reseller.
- The expertise of System Consultants.
- The immediate availability of competitively priced products.
- The resources of one of the world's largest computer companies.

**NEC
NOW**

So call NEC NOW™ and talk to a knowledgeable System Consultant who'll help you design the Direction system that best suits your needs. See why, in an industry where people struggle

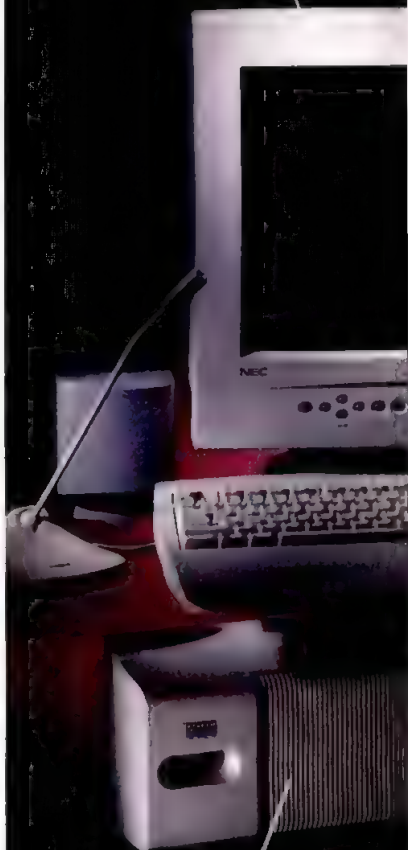
to stay current, NEC offers a more appealing option. Staying ahead.



pentium®

©1997 NEC Computer Systems Division. Packard Bell NEC, Inc. NEC, Versa, and MultiSync are registered trademarks. VersaBay A700, A500 C500, ESM, PortBar, MiniDock and Express5800 are trademarks, and UltraCare is a service mark of NEC Corporation, all used under license by Packard Bell NEC, Inc. Direction, VersaNote, VersaExec, and MagicEye are trademarks and NEC NOW is a service mark of Packard Bell NEC, Inc. Leasing based on typical 36-month lease with purchase option. Other lease options may be available, leasing arranged by third party leasing company to qualified customers. Prices do not include shipping or applicable sales tax, are valid in the US only and are subject to change without notice. Products and specifications are subject to change without notice. *Product is 56Kbps capable. However, due to FCC rules which restrict power output of the service providers, modems, current download speeds are limited to approximately 53Kbps. Actual speed may vary depending on line conditions. MS, IntelliMouse, Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. NetWare and Novell are registered trademarks of Novell, Inc. The Intel Inside logo, LANDesk and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. All other trademarks and registered trademarks are property of their respective owners.

NEC monitor with sharp color and high resolution. Available in a 15" (14" v.i.s.) or 17" (16" v.i.s.) screen.



Wavetable audio system provides clearest sound available.

**BUILT
TO
ORDER**

NEC Direction PCs A new direction in cutting edge technology

Common Features: Mini-Tower or Desktop Tool-Less Chassis • 24X max CD-ROM • 3.5" Floppy Drive • Microsoft® Windows® 95 • MS® Office 97 SBE • 2 USB Ports • Microphone • Palmrest Keyboard and MS IntelliMouse® • 3-Year Limited Warranty with 1-Year On-Site Service

Direction SPT233

- 233MHz Pentium processor with MMX™ technology/512KB L2 Pipeline Burst Cache
- 4.3GB Ultra DMA Hard Drive/32MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec® ACS-45 Speakers/AWE32 Wavetable Audio
- Iomega® Zip Drive
- U.S. Robotics® 56Kbps® Data/Fax/Voice Modem
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to 7.0GB Ultra DMA Hard Drive, add \$109
- * Upgrade to 64MB SDRAM, add \$239

\$2699

Business Lease: \$97/mo.

Direction SPT233

- 233MHz Pentium processor with MMX technology/512KB L2 Pipeline Burst Cache
- 3.2GB Ultra DMA Hard Drive/32MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-45 Speakers/Integrated Yamaha Sound
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to Altec ACS-410 Speakers with ACS-251 Subwoofer, add \$69
- * U.S. Robotics 56Kbps® Data/Fax/Voice Modem, add \$119

\$2399

Business Lease: \$86/mo.

Direction SPT233

- 233MHz Pentium processor with MMX technology/512KB L2 Pipeline Burst Cache
- 4.3GB Ultra DMA Hard Drive/32MB SDRAM
- 4MB SGRAM PCI Graphics Card
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- NEC 15" Monitor (14" v.i.s.)
- * Upgrade to NEC 17" Monitor (16" v.i.s.), add \$199
- * Upgrade to AWE32 Wavetable Audio, add \$49

\$1999

Business Lease: \$72/mo.

Direction SPT200

- 200MHz Pentium processor with MMX technology/512KB L2 Pipeline Burst Cache
- 3.2GB Ultra DMA Hard Drive/32MB SDRAM
- 4MB SGRAM PCI Graphics Card
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- NEC 15" Monitor (14" v.i.s.)
- * Upgrade to NEC 17" Monitor (16" v.i.s.), add \$199
- * Upgrade to Iomega Zip Drive, add \$99

\$1799

Business Lease: \$65/mo.

Direction SPL266

- 266MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 9.0GB SCSI Hard Drive/64MB SDRAM
- Adaptec 2940UW SCSI Controller
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- Iomega Zip Drive
- NEC 17" Monitor (16" v.i.s.)
- MS Windows NT® 4.0
- * Upgrade to 128MB SDRAM, add \$469
- * Upgrade Video Memory to 8MB WRAM, add \$119

\$4199

Business Lease: \$147/mo.

Direction SPL266

- 266MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 4.3GB Hard Drive/32MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-90 Speakers/Integrated Yamaha Sound
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to Wavetable Audio, add \$49
- * Upgrade to U.S. Robotics 56Kbps® Data/Fax/Voice Modem, add \$119

\$2699

Business Lease: \$97/mo.

Direction SPL266

- 266MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 7.0GB Hard Drive/64MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-45 Speakers/Wavetable Audio
- U.S. Robotics 56Kbps® Data/Fax/Voice Modem
- Iomega Zip Drive
- NEC 17" Monitor (16" v.i.s.)
- * Upgrade to Altec ACS-410 Speakers with ACS-251 Subwoofer, add \$69
- * Upgrade to NEC MultiSync® A700™ 17" Monitor (15.6" v.i.s.), add \$299

\$3299

Business Lease: \$119/mo.

Direction SPL266

- 266MHz Pentium II processor with MMX technology/512KB Integrated L2 Cache
- 7.0GB Hard Drive/64MB SDRAM
- Number Nine Revolution 3D, 4MB WRAM
- Altec ACS-90 Speakers/Wavetable Audio
- Iomega Zip Drive
- NEC 15" Monitor (14" v.i.s.)
- * Upgrade to NEC 17" Monitor (16" v.i.s.), add \$199
- * Upgrade Video Memory to 8MB WRAM, add \$109

\$2999

Business Lease: \$108/mo.

Video performance
is enhanced by
4MB of WRAM.

266MHz Intel
Pentium® II processor
(the fastest on
the market!).

Up to 9GB hard drive for
large capacity storage.

Convertible chassis
available as a mini-tower
or a desktop.

SDRAM for
fast memory access.

To order, get a free catalog or
find your nearest reseller call:
Mon-Fri 8am-5pm EST

1-888-8-NEC-NOW

Dept. No. PM530A www.necnow.com

NEC

CIRCLE 153 ON READER SERVICE CARD

SUMMARY OF FEATURES

Internet Service Providers

Online services in black type

Internet service providers in blue type

■ YES ■ NO □ OPTIONAL

In alphabetical order by category

	America Online	CompuServe Interactive	The Microsoft Network	Prodigy Internet	AT&T WorldNet Service	Concentric Network	EarthLink Network
Web address	www.aol.com	www.compuServe.com	www.msn.com	www.prodigy.com	www.att.com/worldnet	www.concentric.net	www.earthlink.net
Phone	800-827-6364	800-848-8990	800-373-3676	800-776-3449	800-967-5363	800-746-2747	800-395-8425
Pricing							
Setup fee	None	None	None	None	None	\$1.00	\$25.00
Monthly fee for basic access	\$9.95	\$9.95	\$6.95	\$9.95	\$4.95	\$7.95	N/A*
Number of hours included	5	5	5	10	Long-distance customers, 5; others, 3	5	N/A*
Each additional hour	\$2.95	\$2.95	\$2.50	\$2.50	\$2.50	\$1.95	N/A*
Monthly fee for unlimited access	\$19.95	N/A*	\$19.95	\$19.95	\$19.95	\$19.95	\$19.95
Connection							
Approximate number of U.S. POPs	Info not available	514	384	500	225	155	673
Maximum dial-up connection speed	56 Kbps	56 Kbps	33.6 Kbps	56 Kbps	28.8 Kbps	56 Kbps	56 Kbps
56-Kbps connections compatible with x2/K56flex	■ ■	■ ■	N/A*	■ ■	N/A*	■ ■	■ ■
Extra charges for 56-Kbps access	None	\$6.00	N/A*	None	N/A*	\$0.25/hour	\$4.95/hour
ISDN/leased-line connections	■ ■	□ □	■ ■	■ ■	■ ■	■ ■	■ ■
Direct TCP/IP connections	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Static IP address option	■	■	■	■	■	■	■
Support and Software							
Included browser	Proprietary	Internet Explorer 3.0 (custom)	MSN Program Viewer	Internet Explorer 3.0	Internet Explorer 3.0 (custom) or Navigator	Internet Explorer 3.0	Navigator 3.0
Supports third-party Winsock applications	■	■	■	■	■	■	■
Provides Windows 3.x TCP/IP stack / dialer	■ ■	■ ■	N/A**	■ ■	■ ■	■ ■	■ ■
Supports OS/2 / Macintosh users	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Supports POP3 mail clients	■	■	■	■	■	■	■
Tools provided:							
archie/FTP	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Finger/PING	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Gopher/Veronica	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
telnet/rlogin	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Web	■	■	■	■	■	■	■
IRC/newsgroup hosts	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Approximate number of newsgroups	20,000	Unlimited	18,000	20,000	25,000	20,000	Unlimited
Personal Web Page							
Free Web page space for each member	2MB per screen name, up to 5 names	5MB	N/A*	2MB	None	5MB	2MB
Charge for extra Web page space	N/A*	N/A*	N/A*	\$1.00/MB	2MB, \$1.95/month; 5MB, \$4.95/month	\$2.00/MB	Varies
Provides HTML authoring tools	■	■	N/A*	■	■	■	■
Web page can contain image maps/ CGI scripts/Java applets	■ ■ ■	■ ■ ■	N/A*	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ (sites of 5MB or more) ■
Web page traffic reports	■	■	N/A*	■	■	■	■
Web site can use virtual domain	■	■	N/A*	■	■	■	■
E-Mail							
E-mail addresses per account	5	1	1	1	1	1	1
User can specify e-mail address	■	■	■	■	■	■	■
Encodes and decodes attachments across the Internet	■	■	■	■	■	■	■
Can send attachments to Internet addresses	■	■	■	■	■	■	■
Technical Support							
Technical-support number	800-827-3338	888-889-2287	425-635-7019	800-776-3449	800-967-5363	800-745-2747	800-395-8410
Hours (eastern time)	24 hours, 7 days	7:00 A.M.-1:00 A.M. M-F; 1:00 P.M.-10:00 P.M. Sat., Sun.	7:00 A.M.-2:00 A.M. M-F; Noon-10 P.M. Sat., Sun.	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days

N/A*—Not applicable: The product does not have this feature. N/A**—Not applicable: The Microsoft Network does not run on Windows 3.x.

YOUR PERSONAL INTERNET
Internet Service Providers

See www.pcmag.com for interactive views

IBM Internet Connection	MCI Internet	MindSpring	Netcomplete	Sprint Internet Passport	SpyNet
www.ibm.net	www.mci.com	www.mindspring.com	www.netcom.com	www.sprint.com	www.spynet.com
800-821-4612	800-550-0927	800-719-4660	800-638-2661	800-747-9428	800-777-9638
None	None	\$25.00	\$25.00	None	None
\$4.95	\$3.00	\$14.95	N/A*	None	\$4.95
3	3	20	N/A*	None	3
\$1.95	\$1.80	\$1.00	N/A*	\$1.50	\$1.95
\$19.95	\$19.95	\$19.95	\$19.95	\$19.95	\$19.95
100	300	257	330	200	514
56 Kbps	28.8 Kbps	56 Kbps	56 Kbps	28.8 Kbps	56 Kbps
■ ■	N/A*	■ ■	■ ■	N/A*	■ ■
None	N/A*	None	\$5.00/month	N/A*	\$8.00/hour
■ ■	■ ■	■ ■	■ ■	■ □	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Navigator 3.0	Internet Explorer 3.02	Internet Explorer 3.0	Internet Explorer 3.0 or Navigator 3.0	Navigator 3.0	Internet Explorer 3.0
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Unlimited	10,000	20,000	21,000	Unlimited	Unlimited
N/A*	N/A*	5MB	1MB	N/A*	5MB
N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
N/A*	N/A*	■ ■ ■	■ ■ ■	N/A*	■ ■ ■
N/A*	N/A*	■ ■ ■	■ ■ ■	N/A*	■ ■ ■
N/A*	N/A*	■ ■ ■	■ ■ ■	N/A*	■ ■ ■
N/A*	N/A*	■ ■ ■	■ ■ ■	N/A*	■ ■ ■
6	1	1	1	1	1
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
800-821-4612	800-348-8011	800-719-4660	800-638-2661	800-786-1400	425-957-8998
24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	24 hours, 7 days	9:00-9:00 M-F

Microsoft Corp.

The Microsoft Network

Two years ago, The Microsoft Network entered the online service market as part of the Windows 95 package, with all of the accompanying fanfare. Today, MSN succeeds mainly in integrating the Internet's content with its own, making it a useful introductory service provider for the novice. MSN received good scores on Inverse's performance tests. Unfortunately, we didn't receive enough pertinent responses to our e-mail survey to evaluate user satisfaction. MSN's current lack of Web hosting services and multiple mailboxes per account limits its usefulness as a business solution.

Pricing for The Microsoft Network is the standard—\$19.95 per month for unlimited access. An alternative pricing scheme is \$6.95 for 5 hours per month, plus \$2.50 for each additional hour.

Our first few installation attempts were unsuccessful. After speaking with Microsoft's technical support, we determined that the problem came from MSN's interaction with our existing antivirus software (Norton AntiVirus). Microsoft explained that since MSN becomes part of the operating system Windows 95, Norton AntiVirus attempts to block its installation. And Microsoft claims that this is the fault of Norton AntiVirus, not MSN. After removing the antivirus program we were able to complete the installation without any more technical problems. MSN provided one of the most entertaining installations and setups we've seen—complete with video and sound—but where most ISPs have you up and running in well under half an hour, MSN's setup process took a full 40 minutes.

Unlike the other online services, connecting to MSN means you actually connect through UUnet, a large Internet backbone provider. The link connects you both directly to the Internet and to MSN's proprietary content, which explains why MSN performed so well on Inverse's tests.

When trying to connect to our local POP during peak hours, we encountered only occasional busy signals, and the backup number always managed to connect. Similarly, MSN achieved good call-success-rate and general-performance

**IN AN INDUSTRY THAT
IT'S COMFORTING SOME**



BEST

Dell By itself at the top of the class,
with fewer reliability problems.



GOOD

**FOR THE SECOND YEAR IN A ROW DELL IS IN THE
TOP TIER FOR OVERALL RELIABILITY AND SERVICE.**

THRIVES ON CHANGE, THINGS DON'T.

DELL DIMENSION[®] XPS H266

266MHz PENTIUM[®] II PROCESSOR
FEATURING MMX[™] TECHNOLOGY

- 64MB EDO Memory with ECC
 - 512KB Integrated L2 Cache
 - NEW 6.4GB Hard Drive (9.5ms)
 - NEW 1000TX Trinitron[®] Monitor (15.9" v.i.s., .26dp)
 - NEW Matrox Millennium II 8MB WRAM Video Card
 - 24X Max³ Variable CD-ROM Drive
 - Integrated Yamaha 16-Bit Sound
 - Altec Lansing ACS-90 Speakers
 - Iomega Zip 100MB IDE Internal Drive with One Cartridge
 - Microsoft[®] Office 97 Small Business Edition plus Bookshelf 96
 - MS Windows[®] 95/MS IntelliMouse
 - 3 Year Limited Warranty⁴ with 1 Year On-site⁵ Service
- ★ Upgrade to 128MB EDO Memory with ECC, add \$499

\$3299

Business Lease⁶: \$116/Mo.
Order Code #500823

DELL DIMENSION XPS H266

266MHz PENTIUM II PROCESSOR
FEATURING MMX TECHNOLOGY

- 32MB EDO Memory with ECC
 - 512KB Integrated L2 Cache
 - 4.3GB Hard Drive (10ms)
 - 1000LS Monitor (15.9" v.i.s.)
 - NEW Matrox Millennium II 8MB WRAM Video Card
 - 24X Max³ Variable CD-ROM Drive
 - Yamaha 32 Wave Table Sound
 - Altec Lansing ACS-90 Speakers
 - Microsoft Office 97 Small Business Edition plus Bookshelf 96
 - MS Windows 95/MS IntelliMouse
 - 3 Year Limited Warranty with 1 Year On-site Service
- ★ Upgrade to 64MB EDO Memory with ECC, add \$220.
- ★ Upgrade to a 6.4GB Hard Drive (9.5ms), add \$95.

\$2799

Business Lease: \$101/Mo.
Order Code #500808

DELL DIMENSION XPS M233s

233MHz PENTIUM[®] PROCESSOR
WITH MMX TECHNOLOGY

- 32MB SDRAM Memory
- 512KB Single Bank Pipeline Burst Cache
- 4.3GB Hard Drive (10ms)
- NEW 1000TX Trinitron Monitor (15.9" v.i.s., .26dp)
- NEW Matrox Millennium II 4MB WRAM Video Card
- 24X Max³ Variable CD-ROM Drive
- Sound Blaster 16 WaveSynth Wavetable Sound
- Altec Lansing ACS-90 Speakers
- Microsoft Office 97 Small Business Edition plus Bookshelf 96
- MS Windows 95/MS IntelliMouse
- 3 Year Limited Warranty with 1 Year On-site Service

\$2399

Business Lease: \$87/Mo.
Order Code #500825

DELL DIMENSION M200n

200MHz PENTIUM PROCESSOR
WITH MMX TECHNOLOGY

- 16MB SDRAM Memory
 - 512KB Single Bank Pipeline Burst Cache
 - 3.2GB Hard Drive (12ms)
 - NEW 800LS Monitor (13.7" v.i.s.)
 - 2MB EDO ViRGE 3D Video
 - 24X Max³ Variable CD-ROM Drive
 - Microsoft Office 97 Small Business Edition plus Bookshelf 96
 - MS Windows 95/MS Mouse
 - 3 Year Limited Warranty with 1 Year On-site Service
- ★ Upgrade to 32MB SDRAM, add \$99
- ★ Upgrade to a 4.3GB Hard Drive (10ms), add \$55.
- ★ Upgrade to an 800HS Trinitron Monitor (13.7" v.i.s., .26dp), add \$49

\$1699

Business Lease: \$61/Mo.
Order Code #500805

"DELL IS THE ONLY COMPANY VOTED TOPS IN BOTH RELIABILITY AND SERVICE CATEGORIES-EARNING A BEST RATING OVERALL." -PC WORLD, JUNE '97

In addition to being dependable and affordable, it now appears we're a little predictable too. That's because we've scored Best Overall in Reliability and Service on PC World's survey, yet again. And not only did we beat 12 "industry leaders," but we also scored five perfect stars in eight of nine survey categories. So what does this mean for you? While we'll continue to impress you with our state-of-the-art technology at incredible prices, you can still expect superior quality components in every computer and, if you should ever need it, the same superior response from the Dell service department. So give us a call now for your new computer or visit our Web page. And you'll discover why, after such a stunning blow like this, the competition's seeing stars. Five of them, actually.



DELL

TO ORDER TOLL-FREE

800-424-1370

TO ORDER ONLINE

www.dell.com/buydell

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT
Sun 12pm-5pm CT In Canada, call 800-233-0702
GSA Contract #GS-35F-4076D

Keycode #04520



¹For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., attn: Warranty, One Dell Way, Round Rock, TX 78682. ²Leasing arranged by third-party leasing companies to qualified customers. ³On-site service provided by an independent third-party provider. May not be available in certain remote areas. ⁴24X Max/12X Min. ⁵Prices and specifications valid in the U.S. only and subject to change without notice. Intel, the Intel Inside logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. MS, Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. ©1997 Dell Computer Corporation. All rights reserved.

MSN's menu of content is primarily based on HTML and Active Server Pages and is accessible either through Internet Explorer or with MSN's own modified but less capable Program Viewer. Its content covers the usual online information—business, health, travel—with transparent links to Internet sites as well as its more stylish multimedia-heavy shows meant primarily as entertainment. Much of the time, you



If you're a novice user looking for a well-integrated mix of proprietary content and Web access, take a look at The Microsoft Network.—*PB*



PC
MAGAZINE
EDITORS'
CHOICE

Since much of the interface is now dominated by the browser, Prodigy has lost many of its proprietary navigation and other controls. It does add some bells and whistles, however. For example, Prodigy includes a Navigation Bar, which uses Windows-like cascading menus, and the Prodigy Toolbar, which is similar to customizable toolbars in Windows applications, to help you navigate quickly. You can add to and modify the toolbar for common Prodigy applications such as the Microsoft Inter-

Currently, Prodigy is testing U.S. Robotics' 56-Kbps x2-compatible modems in five market areas, and it expects to expand this total to 15 areas by the time you read this. For K56flex users, Prodigy was

Prodigy adds several navigation enhancements, including roll-up menus, to your Microsoft or Netscape browser.



The new HP OmniBook 2000, part of our full line of notebook PCs

133-MHz Intel® Pentium® processor with optional MMX™ technology

Multiple-operating-system support including Microsoft Windows® NT 4.0

Lower TCO through DMI and HP TopTOOLS

Modular bay for hot-swappable CD-ROM, FDD or second battery

Bright 12.1" DSTN or TFT SVGA screen

Rated #1 for reliability*

Filled to the brim. Priced a few inches below it.

Exactly how low is the price? See our quick link: www.hpresource.com/omnibook-10

Surfing at (Almost) 56 Kbps

As World Wide Web pages add more graphics, sound, and video, the average 28.8-Kbps and 33.6-Kbps modem user may want more speed. Unfortunately, ISDN, the most widespread high-speed connection available today, is fairly expensive, and cable modems, digital subscriber lines (DSLs), and satellite connections are not widely available (see "Fast Connections to Your ISP," below, for a comparison of upcoming connection possibilities).

But help is on the way. New so-called 56-Kbps modems can provide fast, easy, and inexpensive Internet access to the masses today. Be aware, however, that although most users can expect better performance with 56-Kbps connections than with their older modems, they will more likely get somewhere between 40 Kbps and 50 Kbps. And certain users may not get any speed improvement at all. In order for you to get the performance benefits of 56-Kbps technology, the digital-to-analog conversion must only happen once between the ISP

and your PC. You won't go faster than 33.6 Kbps if you're using your modem behind a private branch exchange (PBX) or some sort of multiplexer, or if there is any other digital-to-analog conversion taking place between the ISP and your home. If your phone lines have always been noisy, you're also unlikely to achieve significantly higher throughput than you're getting today with your V.34 modem.

Furthermore, there are now two competing 56-Kbps standards—U.S. Robotics' x2 standard and Lucent's and Rockwell's K56flex—and equipment based on one will not achieve high speeds with equipment based on the other. Fortunately, an all-encompassing International Telecommunications Union (ITU) standard is expected in early 1998. The performance advantage of 56 Kbps is available in one direction only: downloading data. Uploads still happen at a maximum of 33.6 Kbps. This is not a problem, since Web surfers are primarily downloading Web pages.

We don't see much of a problem for those of you who want to get into 56-Kbps modems right away, because many vendors are making free software upgrades and swaps available to users of today's modems once the standard does arrive.

Before you purchase, though, check with either your ISP or www.mot.com and x2.usr.com to learn which standard may work for you. Motorola and U.S. Robotics provide phone numbers that anyone can use to test their phone line's 56-Kbps capability with an existing V.34 modem.

This new technology has been moving into the market at a very rapid pace, due to its ease of use, low cost, and wide availability. If you have a V.34 modem from a major manufacturer, you may be able to upgrade it easily to 56 Kbps for less than the price of a new one. Your ISP or online service may already have a rollout of 56-Kbps access numbers. Check www.56k.com and www.k56.org for more information.—Andrew Go

Fast Connections to Your ISP

Technology for ISP access	Data-transfer rate	Availability of service	Service cost	Source of service
V.34 modem	14.4–28.8 Kbps, with compressed bursts more than 100 Kbps.	Everywhere.	Standard local telephone line rates, plus ISP charges	All telephone companies.
56-Kbps modem	45–53 Kbps downstream with compression. V.34 upstream.	Estimates vary, but only 55%–90% of installed lines will work in high-speed mode.	Standard local telephone line rates, plus ISP charges.	All telephone companies, but not on all lines.
ISDN adapter or router	56–128 Kbps both ways.	Widely available from local telephone companies	\$350–\$500 up front and \$24–\$60 per month, plus per-minute and premium ISP charges	Almost all local telephone companies
Cable modem	1–27 Mbps downstream. 100 Kbps–2 Mbps upstream (V.34 upstream in some deployments).	Available on a neighborhood basis, depending on service provider. Tens of thousands of active subscribers nationwide.	Varies widely, but often \$100 up front and \$40 per month (including ISP charges).	Local cable television franchises.
Digital subscriber line (DSL) modem	600 Kbps–7 Mbps downstream. 128 Kbps–1 Mbps upstream	Not widely available. Active subscribers number in the thousands nationwide.	Varies widely, but competitive with cable	Local telephone companies, local power companies, ISPs, and other industries.
Digital satellite	400 Kbps–6 Mbps downstream. 14.4 Kbps–2 Mbps upstream.	No theoretical geographical limitations, but services are just starting to launch. Probably practical only in remote areas	Early systems are \$400–\$1,000 for equipment and \$30–\$140 per month for service, plus ISP charges.	CyberStar, Hughes Spaceway, Loral, Motorola, M-Star, Teledesic.
Wireless terrestrial connection	1–20 Mbps both ways	Just emerging. Deployed on a campuswide or neighborhood basis	Not determined	AT&T, cellular companies, and other personal communications service (PCS) license holders



The HP 300 Series Palmtop PC

Featuring the widest screen so you can view information like you would on your desktop PC

VGA wide screen: 640 x 240 pixels

Direct print capabilities through an infrared connection

Wireless e-mail and Internet access via Type II PC Card Modem*

Fast and easy synchronization with your desktop PC

From \$499†

The problem with most handheld PCs is that the screen isn't wide enough

To get the whole picture, see our quick link: www.hpresource.com/palmtop-3

*Optional accessory available at additional price. †Projected U.S. street price. Microsoft and Windows CE are U.S. registered trademarks of Microsoft Corporation. ©1997 Hewlett-Packard Company PPG450

just launching its initial pilot at press time, although these sites were not immediately available for testing.

Prodigy also allows its users to set up Web pages, but unlike AOL, it doesn't provide any Web development tools, though it does provide some useful templates and tips, as well as links to sites with free tools. For the small to medium business market, it hopes to entice organizations by hosting not only Web but mail domains as well. With a base price of \$1,400 per month, the ProHost service will be Prodigy's first entry in this arena.—TP

Internet Service Providers

AT&T Corp.

AT&T WorldNet Service

Since it threw its hat into the ISP ring a little more than a year ago, AT&T has come a long way toward becoming a serious contender. Much of AT&T's success as an ISP may be due to its big presence in telecommunications, but it lives up to its name with solid performance. AT&T WorldNet Service achieved good results on Inverse's performance tests and had good ratings in our informal e-mail survey of user satisfaction, though users sometimes had trouble connecting.

Similar to most of the other ISPs we looked at for this roundup, WorldNet offers a \$19.95-per-month flat-rate plan. It also offers two other pricing plans for those who can live without unlimited Internet access. One plan is for AT&T long-distance phone customers: \$4.95 per month for 5 hours of use and \$2.50 per hour thereafter. Billing for Internet access is rolled into your long-distance statement. Non-AT&T long-distance customers are offered a similar plan but with only 3 hours per month for the same \$4.95 charge, and \$2.50 per hour thereafter. In case you're not able to connect to a local point of presence, or you're on the road, AT&T provides toll-free access for an additional \$4.50-per-hour surcharge on top of the monthly rate.

With its automated installation script,

WorldNet was one of the fastest and easiest services to set up. Within 15 minutes we were surfing the Web, sending e-mail, and accessing newsgroups. Using the Web browser, POP3 e-mail reader, and news reader included with Microsoft Internet Explorer, WorldNet provides a basic, all-in-one approach to accessing the Internet. Unfortunately, you are allowed only one mailbox per account. Since AT&T uses the Internet POP3 e-mail standard, like MCI and Netcom, you can use any POP3-compliant e-mail client you wish. The same goes for newsgroup access; you can use any NNTP-compliant news reader, or the news reader built into Netscape Navigator. AT&T provides access to more than 25,000 newsgroups. Downloads of CyberPatrol and SurfWatch are available from AT&T's home page to block access to the newsgroups and Web sites you find objectionable.

Another service offered by WorldNet is Web site hosting. But AT&T WorldNet charges \$4.95 per month for 5MB of server space, while other vendors such as CompuServe and SpryNet include the same amount of space in the base price. WorldNet also offers 2MB for \$1.95 per month. No CGI capabilities are offered; users seeking advanced Web options should look to Concentric, IBM, Prodigy, or SpryNet instead.

One area in which WorldNet is lacking is high-speed access. At the time of our testing, WorldNet didn't offer any 56-Kbps or ISDN access at any of its points of presence. AT&T plans to add

high-speed access in the future but was not able to give us any dates. Separate from AT&T WorldNet Service, AT&T offers high-speed-access service for corporate LAN-to-Internet connections. That service is priced depending on the corporation's dedicated connection access, be it 56-Kbps, frame-relay, ISDN, T1, or T3. Domain name registering is also available, to give your Web site a name of its own.—PB

Concentric Network Corp.

Concentric Network

Concentric Network shows its experience in the ISP industry by offering a solution that's easy to use for the novice and yet has features—such as telnet and FTP access to your Web-site storage area on the server—that are more compelling for the experienced user. In our informal e-mail survey, users rated the service highly, but on Inverse's tests, Concentric Network's average-throughput score was only fair.

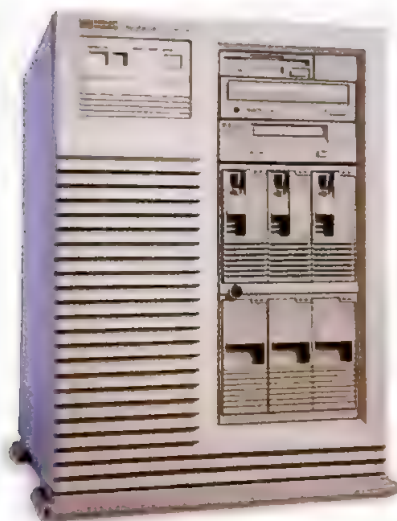
The service has three pricing plans. Similar to other ISPs, it charges a flat rate of \$19.95 for unlimited access. Another plan offers the first month for only \$1, which also covers setup. Then, for \$7.95 per month, you get 5 hours of access time. Each hour thereafter is \$1.95, and toll-free access is an extra \$6 per hour. The third plan, for travelers, costs \$10 for 2 hours of toll-free access and \$5 for each hour of toll-free access thereafter.

Installing and configuring Concentric Network is easy. Similar to most ISP vendors, it uses Windows 95's Dial-Up Networking to connect to its points of presence. During the installation process, however, the service didn't recognize our modem as the one installed by Windows 95 but rather chose a generic modem. This did not cause us any connection problems, but a generic modem string won't necessarily be optimized to give your modem the best performance. Once connected to Concentric Network's home page, a host of links and downloadable files are available. It has also teamed up with Excite! to let you put together a personal news page that is capable of gathering news information from sites all over the Web.

As with other ISPs reviewed here, Concentric Network delivers all of its mail and news through a Web browser. At press time, the vendor was shipping with Netscape Navigator but plans to switch to Microsoft Internet Explorer by the time you read this. Since this model supports Internet POP3 and NNTP standards, any POP3 mail client and NNTP news reader can replace the browser's built-in applications.

Concentric Network is currently testing both of the 56-Kbps technologies, as well as ISDN offerings, and is offering x2





HP's Midrange NetServer LH Pro

Up to 54GB internal hot-swappable storage capacity,
expandable to 324GB external storage

Winner of "Best Product of the Year" for file servers from *PC Magazine*

Up to 1GB ECC memory capacity

Dual processing 6/200 Intel® Pentium® Pro processors

Nine expansion slots—four PCI, four EISA, one shared PCI/EISA

HP Remote Assistant EISA card

From \$6,160*

**The only thing it controls better than
your system is your costs.**

Gain control: www.hpresource.com/lh_server

*\$6,160 is the projected U.S. street price. Intel Inside and Pentium are registered trademarks of Intel Corporation. ©1997 Hewlett-Packard Company PPG449

YOUR PERSONAL INTERNET

Internet Service Providers

56-Kbps access for an extra \$0.25 per hour.

Concentric Network also provides subscribers with a single mailbox and 5MB of storage space, used for storing personal Web pages and other files. This is very generous compared with the 2MB of free space offered by most of the ISPs in this roundup. It provides a wizard to help you create your first Web page easily. Moreover, the service also allows use of CGI scripts, and it offers access to your storage space via telnet and FTP—admittedly, a useful feature for savvy users.

In addition to single-user Dial-Up connections, Concentric offers Concentric Host, a Web-hosting service that's great for families and small businesses.



CONCENTRIC NETWORK CORPORATION

This service should please both novice and advanced users with its ease of use, reasonable pricing, and sophisticated extras.

For \$29.95 per month (and \$50 one-time setup fee), you get five mailboxes, 5MB of disk storage, your own subdomain name (such as *me@myhost.cnchost.com*), and Web publishing software. Additional mailboxes and storage can be added for a fee. This service should please both novice and advanced users with its ease of use, reasonable pricing, and sophisticated extras.—PB

EarthLink Network Inc.

EarthLink Network



EarthLink Network provides a long list of offerings to satisfy a range of Internet appetites. Everything is available, from standard ISP access and personal Web pages to large Web sites (complete with CGI scripts), and even dedicated LAN connections. EarthLink received good scores in our e-mail survey of user satisfaction. Users did say, however, that they sometimes had trouble connecting and using e-mail. The service also did very well on Inverse's performance testing including a good call success rate.

EarthLink, like most of the other ISPs in our roundup, is available for \$19.95 per month for unlimited access, with the addition of a one-time \$25 setup fee. Toll-free access is also available from anywhere in

the U.S. for \$24.95 per month and, after the first 5 hours, an hourly charge of \$4.95. Unlike many of the other ISPs, EarthLink does not offer any optional plans that charge by the hour. For high-speed ISDN connectivity, EarthLink charges a premium. The setup fee is boosted to \$50, and the monthly fee goes to \$34.95 for up to 100 channel hours. Every hour thereafter is billed at \$0.99.

Installing EarthLink was fairly easy but not fully automated. It walks through each step, including setting up Dial-Up networking and TCP/IP, and gives you the chance to approve the changes being made

to your machine. Each screen also includes bubble help. By comparison, other ISPs provide automatic installation of these and other necessary Windows modules during the setup process. Some users will prefer

this hand-holding to programs that configure everything behind the scenes, but others may chafe at having to sit through such steps.

EarthLink ships with Netscape Navigator 3.02 and, like Sprint Internet Passport, uses the built-in browsing, e-mail, and news reader applications. As with other ISPs that rely on browser-based functions, any POP3 e-mail client or NNTP-based news reader can be substituted if you have the desire and know-how. Unlike CSi, which polices its own newsgroup availability, EarthLink's newsgroup access is controlled through the browser and is therefore up to the discretion of the user alone. EarthLink also uses the FTP client built into Navigator but suggests that you download WS FTP or some other Winsock-compatible application for FTP uploading.

In case you've always wanted to set up your own Web page, 2MB of Web-server storage is included with your EarthLink subscription. Although the only tool shipped with EarthLink is QuickSite Lite, its home page does provide links to Web-design information. Additionally, EarthLink offers several options to those requiring more than 2MB of space or wanting CGI scripting capabilities. Prices range from \$89 per month for 5MB of space, with a setup fee of \$179, to \$439 per month for 100MB of space, with a setup



EarthLink Network provides a long list of offerings to satisfy a range of Internet appetites. Everything is available, from standard ISP access to large Web sites.

fee of \$479. This is by far the most space offered by any ISP in this roundup, and also the most expensive—considering that services such as MindSpring include 5MB with the initial fee. All EarthLink accounts with 5MB or above include custom CGI scripting capabilities, daily hit logs, DNS setup, and domain registration.

Other available services include dedicated LAN-to-Internet access for both frame relay and ISDN. Installation charges vary depending on local phone companies. EarthLink supports 56-Kbps modems at a charge of \$4.95 per hour.—PB

IBM Corp.

IBM Internet Connection

IBM Internet Connection is a streamlined ISP that emphasizes performance. As part of its commercial corporate network, this service offers more than 500 worldwide x2-compatible 56-Kbps access numbers. IBM scored the highest rating on Inverse's tests, led by its top-ranked peak-hour connection rate and solid throughput performance. It was also one of the highest scorers on our e-mail survey of user satisfaction.

IBM Internet Connection is a consumer offshoot of IBM's Global Services, which provides network services to business customers. With more than 30,000 organizations subscribing to Global Services, IBM has a fair bit of experience with local access, toll-free access, leased lines, and other types of service connections. IBM Internet Connection does not provide a service for posting free personal Web pages. However, IBM Global Services will host business Web sites for a setup fee of \$1,200 and a monthly charge of \$500 for 50MB of server space.

Unfortunately, IBM Internet Connection was one of the clumsier products we installed. First, there are three different codes that you have to locate in your install documentation before setting up your account. Then, this service supports only seven-digit user names—you start getting pretty inventive to come up with an account name. Finally, even though

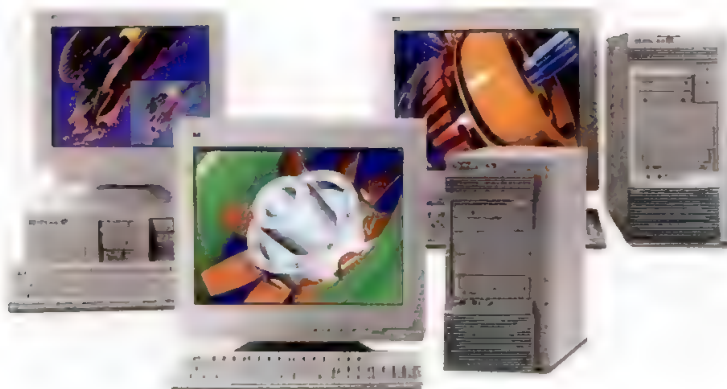


FROM \$992*


**HEWLETT®
PACKARD**

**There's a reason
we're a market leader
in PC Workstations.**

Actually, there are six.



Where to begin? Let's start with innovation. We made the first dual Intel® Pentium® Pro processor-based PC Workstation (*Reason #1*), as well as the first with integrated

Models available with:

233 MHz Pentium processor with MMX™ technology and 200 MHz Pentium Pro processors

Fast 2-D and 3-D OpenGL graphics
EDO and ECC DIMM RAM

Up to 4.5GB 7200 RPM ultra SCSI hard disk drive

Integrated 10/100Base-T networking

HP TopTools desktop management application

Prices start at \$2,712*

networking and SCSI (#2). Then there's our complete range of Intel Pentium Pro processor PC Workstations, including last year's top-selling Pentium Pro processor system (#3). But you're not just buying a system; you're also buying a company. And to that end, our legendary service and support (#4), brand reliability (#5) and UNIX® Workstation heritage (#6) remain unmatched. So what does all this mean? If you're investing in Windows® NT, trust HP.



**Check out the latest reasons at
www.hpresource.com/pcworkstation**

ISP Test and Survey Results

In the gatefold that accompanies this story, we present a brief summary of our test and review results to help you choose your ISP. For those of you who want more in-depth information, we've provided the data in the table below.

• **Suitability to Task ratings.** Here we evaluate the features offered by each ISP, as well as our experience testing the services, and compile ratings (*excellent, good, fair, poor*) for installation and configuration, e-mail and newsgroups, and Web hosting.

• **Inverse performance test results.** We enlisted the help of Inverse Network Technology (www.inversenet.com), a firm based in Santa Clara, California, that measures and reports ISP performance by making more than 60,000 phone calls to 12 of our 13 national providers, plus a few others, over several two-week periods—in this case, two weeks in May 1997. From the results of Inverse's testing, we then created our own ratings for the following performance categories: call success rate during peak hours, Web access success rate, average throughput, Web throughput

success, and overall performance.

• **User survey results.** We sent out an informal multiple-choice e-mail survey to hundreds of users, asking them to rate their satisfaction with the performance, e-mail, and technical support their ISPs provide. We then assigned a numerical rating to each answer (5 = *very good*, 4 = *good*, 3 = *adequate*, 2 = *poor*, 1 = *very poor*). We present the average of the answers to each of the questions, as well as the percentage of users who told us they were thinking of switching to another ISP. Be aware that this report may not be as statistically valid as our annual Service and Reliability Surveys. The results simply give you an idea of what at least 30 users thought of a particular ISP. We left out results for ISPs that did not elicit at least 30 responses.

SUITABILITY TO TASK RATINGS

You'll want the **installation and configuration** to be simple and fast. The process must not intrude significantly on your computer's disk space or alter existing settings such as current networking parameters. We look for software that

walks new users through with install wizards and notifies them of potential problems. We prefer products that automate the process of configuring an IP address and DNS settings and that automatically detect the type of modem you're using. We particularly like services that dial a toll-free number to connect and then make it easy to find local access numbers in your area. You should expect to be able to choose a log-on name and password. We expect vendors to include all the software you need to connect on either Microsoft Windows 3.x or Windows 95.

For **e-mail and newsgroups**, we prefer software beyond the typical components included with Web browsers. We want POP3 mail clients and effortless navigation from a news reader. Users must be able to send attachments and compose and read e-mail off-line. We want multiple mail boxes for each account. Users will want services that host their own newsgroup and IRC servers. Filtering and blocking capabilities are a must for reducing unwanted solicitations and for protection from unsavory content.

ISPs Compared

Online services in black type
Internet service providers in blue type
Suitability to Task Ratings

	America Online	CompuServe Interactive	The Microsoft Network	Prodigy Internet	AT&T WorldNet Service	Concentric Network	EarthLink Network
Installation and configuration	Excellent	Good	Poor	Excellent	Good	Good	Excellent
E-mail and newsgroups	Excellent	Good	Fair	Excellent	Fair	Fair	Fair
Web hosting	Excellent	Excellent	N/A*	Good	Fair	Excellent	Excellent

Inverse Network Technology's Performance Test Results

Call success rate	Poor	Good	Good	Fair	Good	Good	Good
Web access success rate	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Average throughput	Poor	Good	Excellent	Excellent	Good	Fair	Excellent
Web throughput success	Good	Good	Excellent	Excellent	Excellent	Good	Excellent
Overall performance	Poor	Good	Good	Good	Good	Fair	Good

User Survey Results (1 = worst; 5 = best)

Overall satisfaction	3.8	N/A †	N/A †	N/A †	4.3	4.4	4.4
Overall performance	3.6	N/A †	N/A †	N/A †	4.4	4.3	4.4
Frequency of connection success	3.1	N/A †	N/A †	N/A †	3.7	3.7	3.6
Frequency of uninterrupted connections	3.5	N/A †	N/A †	N/A †	4.2	4.0	3.9
Ease of accessing e-mail	4.0	N/A †	N/A †	N/A †	4.0	4.4	3.6
Satisfaction with technical support	3.4	N/A †	N/A †	N/A †	4.3	4.0	4.0
Considering switch to another service	57 percent	N/A †	N/A †	N/A †	23 percent	45 percent	35 percent

N/A*—Not applicable: The product does not have this feature.

N/A**—Not applicable: SpryNet was not included in the Inverse tests.

N/A†—We did not receive at least 30 responses from users of this service.

We evaluate **Web hosting** by noting the disk space allocated, placement on the ISP's Internet backbone, and the amount of free traffic allowed per month. Many will also desire a security standard such as SSL for sites that must be private. More experienced users will want the ability to create subdirectories off their designated directory and to upload entire sites including multiple file types, such as GIF and HTML formats. We give high grades for services that include design tools or support for common tools such as Microsoft FrontPage. For more complex sites, users will want to manipulate their content with server-side capabilities such as CGI scripting. Domain registration fees need to be kept to a minimum, and many subscribers will require reports to track their sites, including daily hit logs.

INVERSE PERFORMANCE TEST RESULTS

Inverse Network Technology makes thousands of calls to ISPs every month to gather connectivity data on the major providers. For the current tests, Inverse

made a total of 64,181 calls to ISPs; at least 4,227 calls were made to each one during the test period, which ran from May 6 to May 22, 1997. Each ISP was tested via 40 different points of presence in 40 metropolitan areas around the U.S. SpryNet was not on the list of ISPs that Inverse tested, however; it shares the same network as CompuServe.

The **call success rate** is based on calls made during the busiest hours for most ISPs—between 6:00 P.M. and 12:00 midnight. It takes each problematic scenario into account: busy signals and circuits, failed modem handshaking, failed log-ons. *Excellent* means that Inverse failed to connect on less than 6 percent of its calls. *Good* means a failure rate of 6 to 10 percent. *Fair* is from 10.1 to 15 percent. *Poor* means a failure rate greater than 15 percent.

The **Web access success rate** indicates how often the ISP succeeds in accessing the World Wide Web. We found that all the services performed at a high level. We gave success rates of 95 percent or more a rating of *excellent* and those from 90 to 94.9 percent a rating of *good*.

Average throughput is a measurement based on visiting ten popular Web sites and timing downloaded pages. We rate speeds over 1.8 Kbps as *excellent*, over 1.7 Kbps as *good*, over 1.6 Kbps as *fair*, and 1.6 Kbps or less as *poor*.

Web throughput success measures how often ISPs succeed in performing downloads, taking into account complete and timed-out failures. Services with failure rates of 5 percent or less receive a rating of *excellent*; those from 5.1 to 10 percent receive a rating of *good*; from 10.1 to 15 percent receive a rating of *fair*; and anything over 15 percent gets a rating of *poor*.

Overall performance is a rating we assigned based on a weighted sum of the individual performance ratings above. We used the following weights: call success rate, 40 percent; Web access success rate, 15 percent; average throughput, 30 percent; Web throughput success, 15 percent.

USER SURVEY RESULTS

In the table, we show the results for six questions:

- How would you rate the service you get from your ISP? (*Very good, good, adequate, poor, or very poor.*)
- When you try to connect to your provider, how often do you get a busy signal or fail to connect? (*Never, almost never, sometimes, frequently, or almost always.*)
- When you're online, how often are you involuntarily disconnected? (*Never, almost never, sometimes, frequently, or almost always.*)
- Taking into consideration your modem type, your connect speed, and the relative responsiveness of different Web sites, how would you rate your provider's average performance? (*Very good, good, adequate, poor, or very poor.*)
- How often do you have difficulty accessing e-mail? (*Never, almost never, sometimes, frequently, or almost always.*)
- How would you rate your provider's technical support? (*Very good, good, adequate, poor, or very poor.*)

IBM Internet Connection	MCI Internet	MindSpring	Netcomplete	Sprint Internet Passport	SpryNet
Fair	Fair	Good	Good	Good	Good
Fair	Fair	Good	Fair	Fair	Fair
N/A*	N/A*	Good	Fair	N/A*	Good
Excellent	Fair	Poor	Good	Good	N/A**
Excellent	Good	Excellent	Excellent	Excellent	N/A**
Excellent	Good	Fair	Good	Excellent	N/A**
Good	Good	Fair	Excellent	Excellent	N/A**
Good	Fair	Poor	Good	Good	N/A**
4.5	4.6	4.7	4.3	4.6	4.2
4.4	4.3	4.6	4.1	4.4	4.2
4.2	4.2	4.0	3.8	3.9	4.1
4.1	4.0	4.3	3.8	4.2	4.1
3.6	4.0	4.4	4.1	4.3	3.9
4.5	4.5	4.4	3.7	4.5	3.9
14 percent	13 percent	22 percent	48 percent	24 percent	39 percent

Industrial

stre **NT** gh.



PENTIUM PRO
PROCESSOR

© 1997 Intel Corporation. All rights reserved. Intel, the Intel logo, Pentium, and the Pentium logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. The Intel Inside logo is a trademark of Intel Corporation. All other trademarks are the property of their respective owners.

Presenting the world's first 10X server for Windows NT.®

In theory, moving to Windows NT means using PC servers to handle the demands of heavy-duty computing.

In practice, it also means you'll be needing PC servers that can provide heavy-duty power.

A perfect example: the Aquanta™ XR/6.

With up to 10 Pentium® Pro processors, it not only offers a whole new benchmark in price/performance, it's **AQUANTA** also incredibly scalable.

Unwaveringly available. And breathtakingly powerful for even the most serious mission-critical tasks.

But as advanced as the Aquanta XR/6 is — a fact you may independently confirm at the spec column on your right — Windows NT clearly doesn't live on boxes alone.

Which is exactly why we remind you of our support staff of thousands worldwide, years of enterprise experience, and relationships with virtually all leading technology partners.

After all, what good is all this power today unless you can depend on it tomorrow?

Click www.aquanta-systems.unisys.com.

UNISYS

When information is everything.



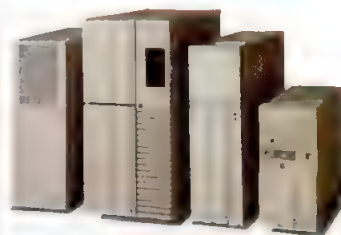
**AQUANTA
XR/6 SERVER**

The first enterprise server for Windows NT® with up to ten 200 MHz Pentium Pro processors. High-performance system bus. Up to 8GB ECC memory and 20MB L3 cache. Internal RAID. Hot-pluggable drives, power and cooling. And VisiNet-II systems management software.



**AQUANTA
HS/6 SERVER**

Engineered for maximum availability, the HS/6 offers up to six 200 MHz Pentium Pro processors. Dual peer PCI/EISA bus. Six RAID-ready bays. 12 slots. And up to 4GB ECC memory and 512KB L2 cache. Plus VisiNet-II systems management software. Rackmount also available.



**AQUANTA
DEPARTMENT
SERVERS**

Servers with one processor to up to four 200 MHz Pentium Pro processors. Rackmount available for dual and quad systems. VisiNet-II systems management software. Perfect for print, file server and LANs.

www.aquanta-systems.unisys.com

CLICK HERE

to find out about our full line of Aquanta products.

IT REALLY IS LONELY

DELL LATITUDE LM M166ST 166MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- 12.1" SVGA Active Matrix Color Display
- 72MB RAM
- 256KB L2 Pipeline Burst Cache
- 2.1GB Hard Drive
- Options Bay accepts 12X Max[®] Variable CD-ROM, 3.5" Floppy Drive, or 2nd Li-Ion Battery (all included)
- PCI Bus with 128-bit Graphics Accelerator with 64K Colors
- Integrated 16-bit Stereo Sound
- Smart Lithium Ion Battery
- 2nd Lithium Ion Battery
- MS[®] Office 97 Small Business Edition
- Microsoft[®] Windows[®] 95
- IrDA 1.0 Standard Compliant
- Touchpad/Under 7 Pounds*
- Extendable 1 Year Warranty†
- ★ Upgrade to a 4GB Hard Drive, add \$349.
- ★ Leather Carrying Case, add \$99.
- ★ Motorola 33.6 Fax Modem, add \$149.

\$3949

Business Lease: \$139/Mo.
Order Code #800143

DELL LATITUDE LM M166ST 166MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- 12.1" SVGA Active Matrix Color Display
- 40MB RAM (72MB Max)
- 256KB L2 Pipeline Burst Cache
- 2.1GB Hard Drive
- Options Bay accepts 12X Max[®] Variable CD-ROM, 3.5" Floppy Drive, or 2nd Li-Ion Battery (all included)
- PCI Bus with 128-bit Graphics Accelerator with 64K Colors
- Integrated 16-bit Stereo Sound
- Smart Lithium Ion Battery
- 2nd Lithium Ion Battery
- Motorola 33.6 Fax Modem
- MS Office 97 Small Business Edition
- Microsoft Windows 95
- IrDA 1.0 Standard Compliant
- Touchpad/Under 7 Pounds
- Extendable 1 Year Warranty
- ★ Upgrade to 72MB RAM, add \$299.

PICTURED SYSTEM

\$3799

Business Lease: \$134/Mo.
Order Code #800151

DELL LATITUDE LM M166ST 166MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- 12.1" SVGA Active Matrix Color Display
- 24MB RAM (72MB Max)
- 256KB L2 Pipeline Burst Cache
- 2.1GB Hard Drive
- Options Bay accepts 12X Max[®] Variable CD-ROM, 3.5" Floppy Drive (both included) or Optional 2nd Li-Ion Battery
- PCI Bus with 128-bit Graphics Accelerator with 64K Colors
- Integrated 16-bit Stereo Sound
- Smart Lithium Ion Battery
- Motorola 33.6 Fax Modem
- Nylon Carrying Case
- MS Office 97 Small Business Edition
- Microsoft Windows 95
- IrDA 1.0 Standard Compliant
- Touchpad/Under 7 Pounds
- Extendable 1 Year Warranty
- ★ Upgrade to 40MB RAM, add \$199.
- ★ 2nd Lithium Ion Battery, add \$199.

\$3499

Business Lease: \$123/Mo.
Order Code #800150

DELL LATITUDE LM M166ST 166MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- 12.1" SVGA Active Matrix Color Display
- 16MB RAM (72MB Max)
- 256KB L2 Pipeline Burst Cache
- NEW 1.6GB Hard Drive
- Options Bay accepts 12X Max[®] Variable CD-ROM, 3.5" Floppy Drive (both included) or Optional 2nd Li-Ion Battery
- PCI Bus with 128-bit Graphics Accelerator with 64K Colors
- Integrated 16-bit Stereo Sound
- Smart Lithium Ion Battery
- MS Office 97 Small Business Edition
- Microsoft Windows 95
- IrDA 1.0 Standard Compliant
- Touchpad/Under 7 Pounds
- Extendable 1 Year Warranty
- ★ Upgrade to 40MB RAM, add \$299.

\$2999

Business Lease: \$108/Mo.
Order Code #800140

NEW DELL LATITUDE LM M163ST 166MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- 12.1" SVGA Active Matrix Color Display
- 16MB RAM (72MB Max)
- 256KB L2 Pipeline Burst Cache
- NEW 1.6GB Hard Drive
- Options Bay accepts 12X Max[®] Variable CD-ROM, 3.5" Floppy Drive (both included) or Optional 2nd Li-Ion Battery
- PCI Bus with 128-bit Graphics Accelerator with 64K Colors
- Integrated 16-bit Stereo Sound
- Smart Lithium Ion Battery
- MS Office 97 Small Business Edition
- Microsoft Windows 95
- IrDA 1.0 Standard Compliant
- Touchpad/Under 7 Pounds
- Extendable 1 Year Warranty
- ★ Upgrade to a 2.1GB Hard Drive, add \$149.

\$2699

Business Lease: \$97/Mo.
Order Code #800154

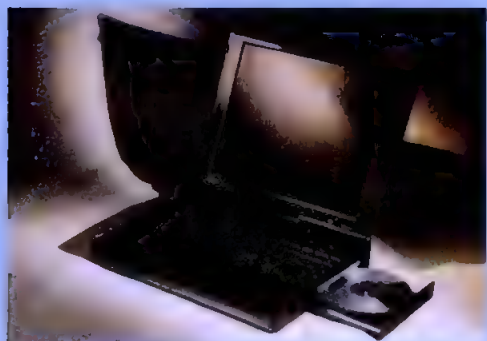
DELL LATITUDE KP CD M166ST 166MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- NEW Network Designed Notebook
- 12.1" SVGA Active Matrix Color Display
- 16MB RAM (80MB Max)
- 256KB L2 Pipeline Burst Cache
- NEW 1.6GB Hard Drive
- Internal 12X Max[®] Variable CD-ROM and 3.5" Floppy Drive
- PCI Bus with 128-bit Graphics Accelerator with 64K Colors
- Integrated 16-bit Stereo Sound
- Smart Lithium Ion Battery
- Microsoft Windows 95
- IrDA 1.1 Standard Compliant
- Optical Trackball/7.4 Pounds
- Extendable 1 Year Warranty
- ★ Upgrade to 40MB RAM, add \$299.
- ★ Upgrade to a 3GB Hard Drive, add \$349.

\$3699

Business Lease: \$130/Mo.
Order Code #800153

AT THE TOP.



READERS' REPORT CARD

Notebook Vendors

A	Dell
B	Hewlett-Packard
	IBM
	Micron
	NEC
	Toshiba
C	Apple
	Compaq
	Gateway
	WinBook
D	Acer
	AST
	Texas Instruments
	ZDS
	ZEOS

PC MAGAZINE
JULY 1997

SERVICE AND RELIABILITY SURVEY

When it comes to service and reliability, who's the one notebook maker you can truly count on? According to the nearly 8,500 people who responded to *PC Magazine's* 10th Annual Service and Reliability Survey, there is only one. (Impressive considering they rated some 3,800 notebooks from 15 vendors, isn't it?) How did we earn the only "A"? Over the last year, our users reported better than average scores on four key measures: satisfaction with reliability, repair experience, and technical support; and the need for recent repairs. They also said they'd buy one again. To say the same for your notebook, visit us on the Web or give us a call.



TO ORDER TOLL FREE

800-374-9223

TO ORDER ONLINE

www.dell.com/buydell

Mon-Fri 7am-9pm CT

Sat 10am-6pm CT

Sun 12pm-5pm.

In Canada,* call 800-233-0702

Keycode #04521

DELL®

we installed IBM Internet Connection on Windows 95, IBM's software still used its own dialer and Trumpet IP stack, both of which seem redundant when you consider that Windows 95 provides all the necessary software. Installation kits for OS/2 Warp and Macintosh users are available as well.

IBM Internet Connection is not for users who require hand-holding. IBM's home page provides access numbers, basic support, and pricing but offers no unique content. By default, installation sets you up with a single mailbox. From the home page, you can later add up to five child accounts for each parent account, unlike most other ISPs, which only allow one mailbox per account. Unfortunately, unlike products such as AOL and Prodigy, the software isn't really set up to change easily from one mail account to another—you have to log off and on again.

The service relies primarily on Netscape Navigator for browsing, e-mail, and newsgroups. Although the product we tested came with Navigator 2.02, you can download Navigator 3.02 as with most other ISPs. IBM doesn't limit access to Internet newsgroups, nor is there any way to block them.



Available in a range of corporate plans, this service starts at \$19.95 per user per month for unlimited access. IBM will host your virtual mail domain as well for a one-time \$500 registration fee. The vendor is clearly tapping into its networking expertise to offer a flexible ISP solution. While it provides no value-added content, it does give you the flexibility of expanding your service from a six-user individual account to an entire company with thousands of users. An improved and more flexible registration process would be a welcome touch. In addition, Inverse reports better performance for IBM during evening hours than during the day—an indication of its commercial leanings. But for users looking for solid performance and basic Internet access, IBM is worth your consideration.—TP

MCI Telecommunications Corp.

MCI Internet

MCI Internet is a straightforward ISP, about as basic as we could have reviewed in this roundup. Using nearly all off-the-shelf software, with little in the way of content or other specialized products, this service is aimed at those focused only on vanilla Internet access. Though it performed reasonably well, MCI Internet didn't distinguish itself on Inverse's performance tests. Its results on our informal e-mail survey of user satisfaction were more encouraging, yielding good satisfaction and performance scores. But whether you're looking for content, flexibility, or performance, there are other services in this roundup that probably are more useful.

Like AT&T, IBM, and Sprint, MCI Telecommunications Corp. is relying on the Internet to draw new users into its extensive communications network. And like most of the ISPs in this roundup, the service ships Microsoft Internet Explorer 3.02 as its recommended browser, though it works equally well with any standard browser such as Netscape Navigator.

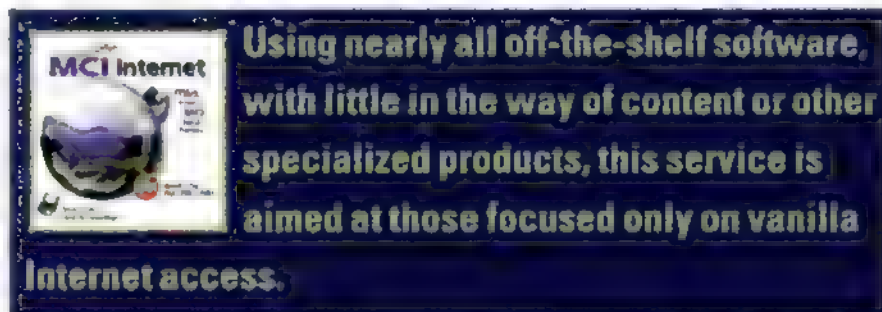
In addition to Internet Explorer 3.0, the installation CD comes with NetMeeting, Microsoft's set of tools for collaborating over the Internet, and PointCast, a popular Internet news service that uses push technology to send users headlines, stock updates, and a variety of useful data (for more information on push services, see "The Intranet Channel" in our issue of June 10, 1997).

Installation of MCI Internet was clear-cut. The installation wizard automatically gathers your registration information, logs you on, helps you find your local access number, and creates a Windows 95 Dial-Up account. It relies entirely on Windows 95 or Internet Explorer features. The only way you know that MCI Internet is installed is to notice that the Internet Explorer activity globe has been replaced by the MCI logo.

MCI Internet uses Internet Explorer's mail reader, but there's no reason that

you couldn't use Eudora 3.0 or another POP3 client. Like many of the services we reviewed, this product supports POP3 servers, but users are limited to one mailbox per account.

When you log on, MCI Internet takes you by default to its home page. Consistent with the service, this is a fairly simple presentation. Some general Internet



sites are listed by headings such as Entertainment, but none of the content is original. For those interested in building Web sites, MCI Internet is a poor choice—it's one of the few products reviewed here, along with MSN and Sprint Internet Passport, that do not offer some sort of Web-hosting option.

MCI currently provides V.34 access only, with no 56-Kbps or ISDN access. On Inverse's performance tests, the service got only a *fair* rating for call success rate—surprising for a company with so much expertise in telecommunications. Survey respondents, on the other hand, gave the service good ratings, with one of the highest overall satisfaction scores; only 13 percent of respondents would consider switching to another service.

With a service based on Microsoft's popular browser, and offering straightforward POP3 mail, as well as a no-frills Web site, MCI Internet couldn't be much closer to a bare-bones ISP.—TP

MindSpring Enterprises Inc.

MindSpring

MindSpring combines a potpourri of standard Internet tools and a proprietary front end to help simplify the often messy process of getting the most out of an ISP. Curiously, MindSpring had the *highest* score for overall satisfaction on our user survey, yet results on Inverse's performance testing were relatively poor. One possible explanation is that MindSpring is an Atlanta-based ISP that expanded nationally when the company acquired the Pipeline ISP accounts from PSINet. Outside the Southeast United States, PSINet and another company



The online service for those who already have a social life.

In the online world, there's a time and place for everything. And when it's time to get things done, there's no better place than CSi (CompuServe). Here, everything is organized with efficiency in mind. Which means you can get to whatever you're after



COMPUSERVE.
Get on with it.

late-breaking news, e-mail, expert advice, or content from the Web—a lot faster, and smarter. So you can get back to the rest of your life a lot sooner. Call us and try CSi yourself. After all, if you're online because you need to be, this is the online service you need.

Call 1-800-376-0969 to get your free CSi software and 10 free hours.

© 1997 CompuServe, Incorporated. All rights reserved. CompuServe is a registered trademark and CSi and the CSi logo are service marks of CompuServe.CIRCLE 275 ON READER SERVICE CARD

called GridNet continue to provide basic access, but MindSpring has taken over the other features of Internet access, such as e-mail, FTP, and news. Although Inverse tested MindSpring, GridNet, and PSINet points of presence across the country, a large majority of MindSpring's users are in the Atlanta area. It's possible that most of our respondents were also from the Atlanta area, and that performance is better there than elsewhere.

On our informal e-mail survey, MindSpring came in first for user satisfaction, which in the ISP business is a rather impressive feat. Subscribers seemed particularly taken with MindSpring's technical support, as well as with their ability to connect—and then stay connected—to



the service.

With its Pipeline+ software, MindSpring differs from many of its competitors by delivering a larger set of Internet tools, including FTP clients. Pipeline+ provides a central access point for the wide variety of shareware software packages that MindSpring has already assembled for its users.

MindSpring's automated installation was one of the easiest of the services we looked at for this roundup. Similar to products such as AOL and Prodigy, MindSpring provides a toll-free number for you to register, find a local-access number, and configure the Dial-Up connection—a procedure that went flawlessly on our tests. MindSpring provides Windows 3.1, Windows 95, and Macintosh versions of Pipeline+. Both the Windows and Mac versions include Microsoft Internet Explorer 3.0. At the bare minimum, you could access MindSpring with one of these or any other regular browser and a Windows Dial-Up connection. Using Pipeline+ and its streamlined command center interface, however, makes accessing MindSpring's individual Internet services a little easier. For example, from Pipeline+ you can launch your browser just by clicking on

the browser button. Or press the mail icon and Pipeline+ launches its POP3 e-mail reader, Eudora Light 3.0.

You can also plug in your own applications. For example, you can replace the Free Agent news reader with any IE reader you wish or replace Eudora with another POP3 e-mail client, using the configure button on Pipeline+. Most of these Internet utilities in Pipeline+ are basic shareware products, including Snappy Software's Wincode uuencode utility and the LView Pro shareware graphics viewer.

Like many of the ISPs reviewed here, MindSpring offers Web hosting—even with its most basic plan, MindSpring Light. Not only does MindSpring provide more basic Web space—5MB, compared

with the 2MB that most other services offer—it also allows you to set up virtual Web hosting. This is especially attractive for smaller businesses wanting to appear to have a greater Internet presence than they can

normally afford. Priced at \$50 per month with a \$175 start-up fee, it's a pretty good deal. Similarly, you can add more mailboxes to even the most basic accounts for an additional \$5 per month.

Access at 56 Kbps is available to the service's users in the Southeast. There, MindSpring is offering U.S. Robotics' x2 modem support. Users in other geographical locations are still at the mercy of PSINet and GridNet. MindSpring plans to offer K56flex 56-Kbps access via its GridNet points of presence.

MindSpring offers some bare-bones content with its *quote.com* financials and Community regional information areas. MindSpring is clearly not competitive in the online arena but offers a unique presence as an ISP. On our tests, its technical staff lived up to its reputation of patience and helpfulness. Though not the most polished interface, Pipeline+ is certainly slicker than the basic interfaces provided by IBM, MCI, or Sprint. Users looking for a solid ISP, basic access tools, and a vendor that's easy to work with probably will want to take a serious look at MindSpring.—TP

Netcom On-Line Communication Services Inc.

Netcomplete

An old-timer in the ISP marketplace, Netcom is holding its own against the competition by introducing newer software and multitiered plans tailored for individuals and small businesses. Netcom placed well on Inverse's tests, emerging in the top tier on the overall-performance rating. The vendor also received a *good* rating for overall satisfaction on our e-mail survey, though users claimed they sometimes had difficulty connecting and rated technical support as merely adequate.

At press time, Netcom offered two pricing plans. The entry-level plan, Netcomplete, offers the standard \$19.95-per-month unlimited Internet access. The next level up is Netcomplete Advantage, with unlimited access and additional software—including McAfee's WebScan antivirus software, Netcom's Unplugged off-line Web browser, and Qualcomm's Eudora Lite e-mail client—for \$24.95. Netcomplete Advantage Pro, which will be available when you read this, is priced at \$29.95 and includes all the features of Netcomplete Advantage, plus access to Netcom's online research database. There is an additional \$25 setup fee for each plan. Premium Dial-Up access is also planned for Advantage and Advantage Pro members to provide levels of guaranteed access in the future. We looked primarily at the entry-level plan for this roundup.



Installation and setup of Netcomplete were fairly simple. A wizard walks you through the process of entering the necessary information. Netcom has gotten away from its NetCruiser application, which provided its own Dial-Up PPP stack; Netcomplete, the replacement, uses Windows 95's Dial-Up Networking. Unlike Netcom's old NetCruiser interface, Netcomplete's interface provides a customizable toolbar for easy launching of the browser and the e-mail and FTP

COMPAQ

Don't feel silly asking a kid for computer advice. We do it all the time.

At Compaq, we find out some amazing things by talking to kids. What they like. And what they don't. We also talk to parents and a lot of other people, too. It's just one of the ways we find out what you want in our Compaq Presario Series. Features like our Creativity Imaging Center and one-touch Internet Access button. If you have an idea, we'd really love to hear it. Visit us at www.compaq-at-home.com.



The new Compaq Presario
1400, 4800, 1200 & 1600 Series.



Have an Internet Service Provider for Internet access and there are fees associated with having one. ©1997 Compaq Computer Corporation. All rights reserved. Compaq, the Compaq logo, and Compaq Presario are trademarks of Compaq Computer Corporation. The Intel Inside Logo and Pentium are registered trademarks of Intel Corporation.



Envision an enterprise that's

totally expandable,

infinitely scalable, completely compatible,

easily manageable, and entirely mobile.



© 2000 Intel Corporation. All rights reserved. Intel, the Intel logo, and the Intel Inside logo are registered trademarks of Intel Corporation. Pentium and the Pentium logo are registered trademarks of Intel Corporation.

Introducing Acer's
mobile client server

solution — the new way to truly realize

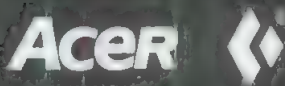
enterprise productivity.

By extending the enterprise into virtual offices, and with an increasingly mobile workforce, it becomes vital to communicate and access critical company information. Anytime. Anywhere.

Acer's Mobile Client Server solutions provide connectivity, security, mobility, accessibility, and manageability. And help you increase productivity and gain a competitive advantage.

As one of the world's largest personal computer and component manufacturers, Acer has state-of-the-art notebooks, desktops, and servers, like the new AcerAltos™ 300 server series featuring the Intel® Pentium® processor. Plus, the channel relationships to optimize your solution and the resources to provide single-call service and support.

Acer's Mobile Client Server. The new enterprise solution that's infinitely expandable. And ultimately the most productive.



1-800-558-ACER & select option 2, 1
www.acer.com/acer/



With an industry leading 7-hour single battery notebook, Acer is redefining mobile solutions.



With a new, affordable network-ready PC, Acer has a range of solutions that make sense.



All Acer servers, at every level, have manageability built-in.



client applications from the desktop.

Netcomplete ships with customized versions of both Microsoft Internet Explorer 3.0 and Netscape Navigator 3.0. Like many other ISPs reviewed here, it uses the POP3 mail client and the news reader built into the browser. Any third-party POP3 e-mail client or NNTP-based news reader can be used instead. In addition to Web browsers, Netcomplete now also ships with a discounted copy of the SurfWatch Web-blocking software (\$9.95, with a \$2-per-month filter update fee).

This product offers only one mailbox with each account. Netcomplete Advantage, by comparison, offers the same basic options as Netcomplete but with two mailboxes—one for personal use and one for business use. Additional mailboxes can be added to Netcomplete Advantage accounts for \$5 per month.

Netcom currently offers x2-compatible 56-Kbps access for an extra \$5 per month. ISDN access is available. It also offers dedicated LAN-to-Internet access for businesses as an entirely separate service. As with the Netcomplete packages, there

are three direct-access pricing options available to connect your business to the Internet.

Personalized news and financial tools are also included, courtesy of a company called Individual. Netcomplete subscribers receive a mere 1MB of storage space to publish personal Web pages, compared with 2MB or even 5MB available from other services. There are no pricing options for Web sites that need more than 1MB of storage space. But Netcom provides a copy of the Page-Builder Web authoring utility to assist in creating new Web pages, as well as an FTP client for uploading the page to your Web space. The ability to search for other Netcom members' Web pages is available via an Excite! search engine.

Netcom's Netcomplete offers all of the basics, and more, for Internet access. But extra charges for some features such as high-speed modem access that other ISPs include in the base price mean that, although existing Netcom customers may be inspired to upgrade, new users may simply start to look elsewhere.—PB

Sprint Communications Co.

Sprint Internet Passport

Aggressively priced and easy to use, Sprint Internet Passport, from Sprint Communications Co., achieved top-notch scores on both our informal e-mail survey of user satisfaction and Inverse's performance tests. But if you're looking for high-speed access or Web-hosting capabilities, look elsewhere. For now, Sprint's consumer product does not support either, though it plans to do both by the end of the year.

Passport fared well on Inverse's performance tests—earning a spot in the top tier of our roundup, second only to IBM Internet Connection in performance. Additionally, our e-mail survey showed that Sprint users are happy with the service. Much of Passport's performance is due to Sprint's superb backbone network, which it claims carries 50 percent of all domestic and 60 percent of all international Internet traffic.

Sprint Internet Passport is available in two different pricing plans, both with

Are you the

eNTerprising

type?

CLICK HERE
to learn how Aquanta™ servers can bring
the power of Windows NT® to your enterprise.

www.aquanta-systems.unisys.com

UNISYS

When information is everything.

YOUR PERSONAL INTERNET
Internet Service Providers

the first month free. Like most of the other ISPs we looked at for this roundup, Sprint offers unlimited access to the service for \$19.95 per month. If you don't require unlimited access, Sprint's second plan offers an hourly charge of \$1.50 with no base charge. By comparison, SpryNet charges \$9.95 for the first 7 hours each month and \$1.95 every hour thereafter. Toll-free access is also available for the roaming Sprint user at an additional \$4.80 per hour—SpryNet charges \$6 per hour.

Installing and setting up Passport is relatively painless. A wizard walks you through the first steps and connects you to online registration via several HTML-based forms. These forms walk you through entering charge card numbers and configuring local-access numbers. As



with other ISPs, this step is completed over a secure toll-free number.

After signing up, we connected to Passport and commenced surfing. Like EarthLink, Sprint Internet Passport uses Netscape Navigator 3.0's built-in browsing, e-mail, and news reader applications. As with most ISPs that rely on the Web browser for newsgroup access, the available newsgroups number in the thousands, and any access control is handled by the user through the browser. Like most of the ISP-only vendors, Passport offers only a single mailbox for each account. It also allows you to use Microsoft Internet Explorer if you wish. Moreover, since Sprint Internet Passport supports Internet-standard POP3 e-mail and NNTP news, any third-party client can be used in place of the all-in-one browser solution.

Unlike SpryNet, Passport does not currently offer any end-user, high-speed Dial-Up access via ISDN or 56-Kbps modem, nor does it provide any Web-hosting capabilities. But Sprint does claim that it will be adding support for both features by the end of this year. Meanwhile, Sprint offers business plans for dedicated LAN-to-Internet connec-

tivity services via frame-relay networks, ISDN, or T1.

If you're in the market for a reliable Internet solution, take a look at Sprint Internet Passport. Keep in mind, however, that if you're a residential user, you'll have to wait for high-speed and Web page capabilities.—PB

CompuServe Inc.

SpryNet

CompuServe's Internet-only sister service, SpryNet, provides users with a straightforward, easy way to access the Internet. SpryNet is the one ISP in our roundup that wasn't tested by Inverse. Though we have no specific performance test results for SpryNet, it shares its network with CompuServe Interactive, which boasted good performance results.

Meanwhile, in our informal e-mail user survey, SpryNet turned in some good scores but garnered lackluster responses in the e-mail and technical-support departments.

Features such as a generous 5MB of Web hosting—compared with 2MB for EarthLink and Prodigy—make this service a worthwhile choice for either the novice or the savvy user. Unlike its online sister service, SpryNet is aimed toward a user audience that wants Internet access without all the extra packaging and proprietary content.

SpryNet's reliable connectivity stems from the fact that it shares CompuServe's worldwide points of presence and backbone network. SpryNet charges \$19.95 per month for unlimited access. It also provides two hourly access plans—at \$9.95 for 7 hours per month, or at \$4.95 per month with 3 hours of access time. A \$1.95-per-hour charge is added after the base time is exceeded on both plans. Toll-free access is available for road warriors, with a \$6-per-hour surcharge.

Installation and setup of SpryNet were relatively easy and uneventful. At press time, CompuServe announced it will be offering customized versions of both Microsoft Internet Explorer and Netscape Navigator for your browsing pleasure. We used Internet Explorer 3.0 on our tests. The setup runs through a

number of steps, all of which flowed smoothly: After calling the toll-free number, signing up, and choosing the nearest point of presence, all we had to do was set up the browser, e-mail client, and Windows dialer, and we were ready to roll.

SpryNet recently moved away from its proprietary client, SpryNet Mail, and began shipping with the POP3-compliant Microsoft Mail Client. The e-mail client is accessible from within the Web browser or on its own. SpryNet supports multiple user accounts, though—like MCI Internet—it's limited to only one mailbox per account. Since SpryNet's e-mail is POP3 compliant, you can substitute Eudora or any POP3 mail client with this service to access your e-mail. Newsgroup reading, on the other hand, is provided by whichever NNTP-compliant reader is built into your Web browser. As with CompuServe Interactive, SpryNet filters out newsgroups that it considers objectionable.

SpryNet includes a generous 5MB of personal Web-hosting space and tools to help you build your site. How-To links are provided on the SpryNet home page to help you make the leap to building your first Web page. In addition to Web-hosting help, the SpryNet home page adds a personal touch to your Internet experience by providing you with a fully customizable news page you can tailor to your interests.

SpryNet offers high-speed access via ISDN. The service is also testing x2-



compatible 56-Kbps access, available for an extra \$6 per hour. SpryNet does provide for some additional business services such as domain name hosting through SpryNet for Business.

Like AT&T, SpryNet offers inexpensive Internet access without a lot in the way of bells and whistles. It offers more Web space than most of the ISPs in this roundup, and businesses needing high-speed access can turn to SpryNet when ISPs such as AT&T and Sprint let them down.—PB □

Just think. A color laser printer that won't give you headaches.



The new Tektronix® Phaser® 560 printer ■ Takes the migraine factor out of network color printing ■ Vibrant Tektronix color (true 1200 dpi) for under ten cents a page ■ Fastest desktop color laser printer ■ Easy-to-read gauge lets you check paper and toner levels right from your computer screen ■ All for \$3,995 ■ Sure beats ibuprofen ■ For the facts call 1-800-835-6100, ext. 1503, or visit www.tek.com/CPad?1503*

Tektronix®

*Estimated U.S. selling price; reseller price may vary. © 1997 Tektronix, Inc. All rights reserved. Tektronix and Phaser are registered trademarks of Tektronix, Inc.

PC Tech



Energizing Your Web Pages

You've used a variety of elements to make your pages dynamic. Now you can make those elements communicate.

By William Robert Stanek

By now you've probably tried your hand at creating your own Web pages. No doubt your first attempts were more functional than cool, but in time you probably added scripts, applets, controls, and plug-ins to make your pages dynamic and interactive. Now what? What can you do to add a new level of sophistication to your pages?

You can give your pages' component elements the power to communicate with each other using LiveConnect and ActiveX. The competing technologies from Netscape and Microsoft, respectively, allow scripts, applets, controls, and plug-ins to interact. You can think of LiveConnect and ActiveX as the glue that connects all the elements on your Web page, making them branches of a single tree you can manipulate and customize on the fly.

As you might expect, Netscape and Microsoft have adopted different methods for creating pages with interactive objects. But fortunately,

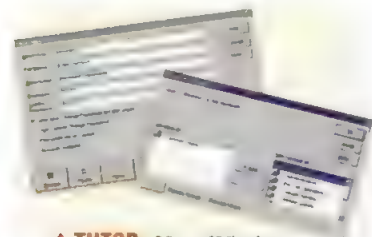
the technologies aren't radically different, and you can make pages that support both without having to duplicate the entire design process. To help you get started, let's take a look at what you need to know to take advantage of LiveConnect and ActiveX right now.

INTRODUCING LIVECONNECT

LiveConnect is one of the key technologies in Netscape's revved-up Open Network Environment (ONE), in which scripts are the connective tissue that allows you to customize the behavior of applets and plug-ins, applets can be used to change plug-ins and scripts dynamically, and plug-ins have total access to scripts and applets as well. The technology is built into Netscape Navigator, so you don't have to do anything special to view Web pages that use LiveConnect.

Before LiveConnect there was no easy way for Web publishers to create pages with interconnected applets, scripts, and Netscape plug-ins. Scripts could call the functions of other

INSIDE



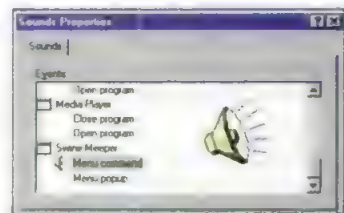
▲TUTOR: How Windows 95, Windows NT and Unix differ in their implementations of user access and administration. *Page 257.*

OPERATING SYSTEMS:

Windows NT's PPTP support allows virtual private networking over the Internet. *Page 263.*

POWER PROGRAMMING: How to write a derived class in Microsoft Visual C++ and package it in an MFC extension DLL. *Page 269.*

UTILITIES: ShutUp gives Windows 95 users a way to run programs, perform common cleanup tasks, and display reminders when shutting down their systems. *Page 275.*



▲SOLUTIONS: Can Windows recognize two mouse pointers at a time; why you may be losing numerals when you use Word's numbered list feature. *Page 287.*

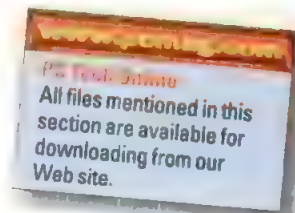




FIGURE 1: Via JavaScript, HTML button controls can access the basic operations of a plug-in.

scripts but couldn't reach out to the applets or plug-ins. Similarly, applets could call methods of other applets and plug-ins could call other plug-in functions, but neither applets nor plug-ins could interact. LiveConnect eliminates those limitations. At its heart is a framework that extends existing technologies, including JavaScript, Java, and the Netscape Plug-in API, and enables them to interact. The extensions for JavaScript let your scripts communicate with applets and plug-ins, while those for Java let applets communicate with scripts and

plug-ins. And together, the LiveConnect extensions for Java and JavaScript allow your plug-ins to interact with scripts and applets.

As you set out to work with LiveConnect, keep in mind that the technology is built only into Navigator. To take advantage of the latest LiveConnect enhancements, use Version 3.0 or later, and don't forget to enable Java and JavaScript in your browser.

INTRODUCING ACTIVEX

ActiveX is a powerful technology built into Microsoft's Active platform. With ActiveX, scripts can customize the behavior of applets and ActiveX controls, applets can update and interact with controls and scripts, and controls can work with scripts and applets as well. Because the technology is built into Internet Explorer, you do not have to do anything special to view pages that use ActiveX.

Like LiveConnect, ActiveX provides a framework that extends existing technologies and makes it possible for them to interact with one another. ActiveX extensions allow scripts written in VBScript and JScript to interact with Java applets and ActiveX controls. Extensions to Java allow applets to interact with scripts and controls.

Just as LiveConnect is designed to work

with Navigator, ActiveX is a Microsoft technology designed for Internet Explorer. To use ActiveX, you should have Version 3.02 or later, and you should enable all the settings for Active content in your browser. Navigator can support ActiveX through a third-party plug-in, but there's no equivalent add-in to make Internet Explorer support LiveConnect.

ENERGIZING YOUR SCRIPTS

LiveConnect and ActiveX give your scripts access to other objects in your Web pages. There are pitfalls, of course. You'll have to rewrite some applets and plug-ins to make them work properly with other objects, especially if you use sockets or try to pass data from an array. But the scripting extensions are relatively easy to use, and you don't have to be a programmer to create a terrific page with objects that are connected and interactive.

Suppose you have created a ScrollText applet, which continuously scrolls the same message. With LiveConnect or ActiveX you could use a script to send new messages to the applet. Because scripts can be executed based on user actions and timers, you could update the applet based on a user selection or timetable. Similarly, you could send updates to an Animator applet. In that case, your

```
<HTML>
<HEAD>
<TITLE>LiveConnect Demo with JavaScript and a Netscape
Plug-in</TITLE>
</HEAD>

<SCRIPT LANGUAGE="JavaScript1.2">
<!--
function aviControl(theKey) {

switch (theKey) {
  case "Play" :
    document.Video.play()
    break;
  case "Stop" :
    document.Video.stop()
    break;
  case "Pause" :
    document.Video.pause()
    break;
  case "FF" :
    document.Video.forward()
    break;
  case "Rev" :
    document.Video.reverse()
    break;
  default :
    document.Video.play()

```

```
}
}

// -->
</SCRIPT>

<BODY BGCOLOR="#FFFFFF">

<H1>Video Example</H1>

<DIV ALIGN=CENTER>

<EMBED NAME="Video" SRC="hello.mpeg" WIDTH=300 HEIGHT=200>

<FORM>
<INPUT TYPE="button" Value=" " onClick="aviControl('Play')">
<INPUT TYPE="button" Value=" <<" onClick="aviControl('Rev')">
<INPUT TYPE="button" Value=" >>" onClick="aviControl('FF')">
<INPUT TYPE="button" Value="||" onClick="aviControl('Pause')">
<INPUT TYPE="button" Value="0" onClick="aviControl('Stop')">
</FORM>

</DIV>

<HR SIZE=5 NOSHADE>

</BODY>
</HTML>
```

FIGURE 2: Controlling a Netscape plug-in with a script.



script would send new parameters to change the way the animation runs. By adding buttons that invoke script functions to your Web page, you could create an interactive animator. With pull-down menus for selecting graphics, you could allow users to run animation sequences or even to piece together the frames of the animation.

You can jazz up the plug-ins in your Web pages as well. Instead of using the default controls for your video plug-in, you could create custom controls with HTML buttons or graphics, then use the connectivity enhancements to call plug-in functions when the custom controls are activated. By updating the controls to reflect a user's selection, you could make your Web page even more dynamic.

ENERGIZING APPLETS

Communication is a two-way street. Just as scripts can call other objects, with LiveConnect and ActiveX applets can also call other objects. Although the technologies make connectivity easier, getting applets to call other objects requires fairly extensive programming skills. Still, once you master the necessary techniques, you can change the way your applets work. An applet can become a vehicle for real-time interaction. Your applet could send live updates to a banner script that displays sports scores on a browser's status bar. The applet could send the same data to a plug-in or control that would display the data as part of a Shockwave presentation.

ENERGIZING PLUG-INS AND CONTROLS

LiveConnect and ActiveX also change the way plug-ins and ActiveX controls can be used in Web pages. For example, most plug-ins are used to play multimedia files, such as video or audio. Multimedia plug-ins ordinarily have basic playback interfaces, such as play and stop buttons. With LiveConnect, you can extend the playback interface so that the plug-ins can call applets or scripts, based on a user's selection. Choosing Play could start a slide show to accompany an audio track. When a user stops a video, your script could display an alert.

Keep in mind that plug-ins are a Netscape technology and ActiveX controls are a Microsoft technology. When you want to access one company's technology in the other company's browser, you are relying on a middleman to get the job done. Anytime you use plug-ins in Internet Explorer, you are relying on Microsoft's plug-in emulator framework. To access ActiveX controls in Navigator, you must use the ScriptActive plug-in from NCompass Labs (www.ncompasslabs.com/scriptactive).

To minimize compatibility problems, you

```
<HTML>
<HEAD>
<TITLE> Starting and stopping an applet using a script </TITLE>
<SCRIPT LANGUAGE="JavaScript">

function hello() {
    document.scroll.start()
}

function bye() {
    document.scroll.stop()
}

</SCRIPT>

</HEAD>
<BODY>
<P ALIGN=CENTER>
<APPLET CODE="ScrollText2" NAME="scroll" WIDTH=600 HEIGHT=100 MAYSCRIPT>
</APPLET>
</P>

<FORM>
<INPUT type="button" VALUE="Start" onClick="hello()">
<INPUT type="button" VALUE="Stop" onClick="bye()">
</FORM>

</BODY>
</HTML>
```

FIGURE 3: Controlling an applet with a script.

may want to use a script to generate unique Web pages for different browsers. You would design different pages for each browser type you plan to support as well as for a generic browser (one that supports neither of the advanced technologies), then use a script to generate the necessary markup based on browser type. (Customizing pages for different browsers is discussed in detail in "Spotlight on JavaScript," *PC Magazine*, June 24, 1997.)

BEHIND THE SCENES WITH LIVECONNECT

Now that you have an idea of the possibilities, let's take a look at how these technologies work. First we'll explore the LiveConnect enhancements to the Java, JavaScript, and Netscape plug-in environments, which rely heavily on object-oriented programming and object-oriented design.

Once you've created an object, you can use the basic structures of your programming language to access it and its functions. As long as you know the function names and parameters, you can use the same object in other programs without ever having to modify its code. For example, the developers at Netscape applied the concepts of encapsulation and code reusability to make Java aware of JavaScript. Because

JavaScript is an object-based scripting language, the task of extending Java to include the necessary objects for JavaScript was greatly simplified. First JavaScript objects were redefined as Java objects. The result was a new Java package called `netscape.javascript`, which contains two main classes, `JSObject` and `JSEException`. `JSObject` holds the complete object structure for JavaScript. `JSEException` allows Java applets to handle exceptions if your script returns an error.

The next step was to close the loopholes LiveConnect created in Java's security model by enhancing the security mechanisms that existed in the original Java package. These mechanisms implement the strict security and control features necessary to keep malicious coders from taking advantage of the new connectivity between JavaScript and Java. The changes mean that Netscape Navigator implements its own version of Java, with extensions that are not part of standard Java.

Because JavaScript is merged into the Java object structure, scripts can access all public classes and methods of an applet running in a Web page. Similarly, because the JavaScript object hierarchy is part of Java's object structure, Java methods can call JavaScript func-



INTRODUCING THE WORLD'S FIRST 19" MONITOR.



A breakthrough from Hitachi.

It's not just a new monitor size. It's new display technology that's got everything you ever wanted in a big screen monitor — better performance, smaller footprint, even the perfect price.

	HITACHI ELITE 751	SONY 20SEII
TUBE SIZE	19"	20"
PITCH	0.22 (H) 0.14 (V)	0.25
MAX. REFRESH @ 1600 x 1200	75 Hz	75 Hz
SUGGESTED RETAIL	\$1,149	\$2,000

**THE SONY IS AN
INCH BIGGER BUT
COSTS 74% MORE.**

*Get similar savings over other high-end
20 and 21 inch monitors as well*

The performance of the best 21" monitor.

The image quality of the new 19" SuperScan Elite 751 is every bit as good as the best 21" monitor — and in some ways better. For example, its focus is a full 30% sharper than the previous state-of-the-art. Plus it delivers brighter, richer color and improved contrast at the same time.

It's also one of the few monitors of any size that gives you *genuine* 1600 x 1200 resolution — not a simulation. And one of

fewer still that does it flicker-free to the VESA recommended 75 Hz refresh rate.

The new tube with multi-step dynamic focus and auto-astigmatism correction is also flatter than many CRTs so it

displays a more accurate image with less distortion, even at screen edges and in the corners.

The footprint of a 17" monitor.

Look at the footprint and you're in for another surprise. The same technology that made our tube better also made it shallower — just 18.1". So it fits on narrower work surfaces.

And it's priced at just \$1,149 (SRP*)

There's one more bonus to our new 19" tube technology. It's a lot less expensive to make so it goes for hundreds less than a comparable 20" or 21" monitor.

So if you want the resolution of a big screen monitor without the bulk and price of a conventional 20 or 21, you've got to see

the new Elite 751. Call for details and dealers near you.

800 441-4832.

MONITOR	TUBE SIZE (Viewable size)	PITCH (mm)	1600 HORIZONTAL PIXELS?
NEC P750	17" (15.6")	0.25 mask	NO
SONY 17SEII	17" (16.0")	0.25 AG	NO
HITACHI ELITE 751	19" (18.0")	0.22 horiz.	YES (1672)
SONY 20SEII	20" (19.1")	0.30 AG	NO
VIEWSONIC GT800	20" (19.1")	0.30 AG	NO
MITSUBISHI 91TXM	21" (19.7")	0.28 AG	NO

Beware of monitors that claim 1600 x 1200 but lack a tube that can resolve 1600 horizontal pixels. Compare screens at 1600 x 1200 before you buy.



SuperScan
An advantage you can clearly see.

HITACHI



NOW YOU SEE IT BETTER.

TeleVideo WebOptimized Monitors

Introducing TeleVideo's SuperView Series™ and Super-View Pro Series™. A complete line of feature rich color monitors – WebOptimized for your comfort and reliability. Our finely crafted monitors have the highest horizontal frequency up to 107KHz, a dot pitch as fine as 0.26mm, flicker-free refresh rates, digitized on-screen controls with memory recall and more. The spectacular specifications of our monitors allow you to comfortably enjoy razor-sharp images and exquisite shapes with optimum brilliance and vivid detail. As a leader in display technology for over two decades, we know how to optimize our monitors to make them ideal for the Web. Now you can enjoy the ever-evolving digital world of the Internet, DVD, desk-top publishing, high-end CAD and more. Break through all your conceptual horizons with TeleVideo.

TeleVideo

Over 20 years of display technology serving for you.

Call your favorite reseller today or call us at 1-800-835-3228 x 474 or 408-954-8333. Or, visit our website: www.televideo.com

15" Models					17" Models					21" Models				
	Dot Pitch (mm)	Max. Res. (HxV)	H-Scan (KHz)	ERP (\$)		Dot Pitch (mm)	Max. Res. (HxV)	H-Scan (KHz)	ERP (\$)		Dot Pitch (mm)	Max. Res. (HxV)	H-Scan (KHz)	ERP (\$)
TeleVideo SV100	0.28	1280x1024	30-70	324	TeleVideo SV210	0.26	1280x1024	30-70	568	TeleVideo SVP350	0.28AG	1600x1200	30-107	1689
PanaSync E15	0.27	1024x768	30-61	399	NEC XV17+	0.28	1280x1024	31-65	850	NEC P1150	0.28AG	1600x1200	31-94	2079
Mag InnoVision DX1595	0.28	1280x1024	30-65	429	PanaSync S17	0.27	1280x1024	30-69	799	Sony CPD300SF	0.30AG	1600x1200	30-85	1999
Viewsonic 15GS	0.28	1280x1024	30-69	429	ViewSonic 17GS	0.27	1280x1024	30-69	699	ViewSonic PT810	0.30AG	1600x1200	30-96	1899

© 1997 TeleVideo, Inc. The TeleVideo name and logo are registered trademarks and SuperView is a trademark of TeleVideo. All other names are the service mark, trademark or registered trademarks of their respective owners. TeleVideo reserves the right to change specifications without notice.

CIRCLE 060 ON-READER SERVICE CARD

tions. As we'll see later, Microsoft chose a comparable path for extending Java, JScript, and VBScript.

Getting Java and JavaScript to understand the Netscape plug-in architecture was not as easy. Most of the plug-in architecture is defined with C and C++ structures. Although some of it is object-oriented, much of the architecture has no object base. For that reason, the developers chose to define Java methods in terms of C/C++ structures. The goal was to get plug-ins to believe Java methods were actually plug-in functions.

The developers relied on the Java Runtime Interface (JRI) to create the structures that allow plug-ins to communicate with Java applets, and the plug-in architecture was extended as well so that plug-ins could use the JRI to access Java. Many vendors offer a JRI, but only Netscape's own implementation or another compatible implementation can generate the files you need.

Java itself needed to be extended so that applets could access plug-ins. To make Java aware of the plug-in architecture, the standard set of Java objects was extended to include the necessary objects for plug-ins. The result was a new Java package called `netscape.plugin` that contains a single class called `Plugin`, which contains the complete structure for the Netscape plug-in architecture.

Because JavaScript is merged into the Java object model, your scripts have access to plug-in functions as well. Thus, when you access plug-in functions from JavaScript, you are really accessing these functions via the Java object model.

BEHIND THE SCENES WITH ACTIVEX

Slicing away the layers of technology for a behind-the-scenes look at ActiveX is not easy, primarily because so many technologies are involved. Let's first look at scripting.

With Internet Explorer, scripting is enabled through the JScript and VBScript interpreters and the Internet Explorer object model. Just as the core functionality of JScript is defined in the JScript interpreter, the core functionality of VBScript is defined in the VBScript interpreter. Both JScript and VBScript are extended with Internet Explorer's object model, which provides a large portion of the functionality of the scripting languages. Whenever scripts interact with elements on a Web page, the interaction is handled via Internet Explorer's object model.

The necessary framework for connecting technologies is provided by ActiveX, which is built on the Component Object Model (COM), the Distributed Component Object Model (DCOM), and Object Linking and Embedding

```
<HTML>
<HEAD>
<TITLE> Starting and stopping an applet using a script </TITLE>
</HEAD>
<BODY>
<P ALIGN=Center>
<APPLET CODE="ScrollText2" NAME="scroll" WIDTH=600 HEIGHT=100 MAYSCRIPT>
</APPLET>
</P>

<FORM>
<INPUT type="button" VALUE="Start" onClick="document.scroll.start()">
<INPUT type="button" VALUE="Stop" onClick="document.scroll.stop()">
</FORM>

</BODY>
</HTML>
```

FIGURE 4: Calling the applet methods from the body of the document.

(OLE). Together the three technologies allow objects to interact regardless of where they are located. Objects that are supported by ActiveX include controls, scripts and applets.

With the exception of Java applets, each type of object supported by ActiveX has its own framework. The Active control framework provides the necessary hooks for connecting COM objects and ActiveX controls to other objects. The Active scripting framework provides the necessary model for scripts to interact with other objects. Instead of creating a separate ActiveX framework for applets, the developers extended Java so that it understands ActiveX. In this way, ActiveX is just another object available to Internet Explorer's Java Virtual Machine.

Getting applets and controls to communicate relies on fooling applets into believing control functions are Java methods, which is a 180-degree twist from the way communication hooks for applets and plug-ins are created with LiveConnect. There are several ways you can create Java structures for your ActiveX controls. Using Visual J++, you can use the Java Type Library Wizard to import the control, which effectively creates the necessary .CLASS files that tell your applet about the control. You can also use Microsoft's Jcom tool to import the control and generate the necessary .CLASS files. Either way, once the .CLASS files are generated, your applets will be able to communicate with their associated controls.

CONNECTING A SCRIPT AND A PLUG-IN

Figure 1 shows an example of using LiveConnect and JavaScript to control a plug-in. You control the plug-in by calling its functions via the name defined for the plug-in in the `<EMBED>` tag. Here, the object is an instance of a video plug-in that is defined as follows:

```
<EMBED NAME="Video" SRC="hello.mpeg"
HEIGHT=300 WIDTH=200>
```

Once you've added a plug-in to your Web page, LiveConnect makes it accessible via JavaScript's document object. If you have written a few scripts in JavaScript, you probably know that the document object gives you access to all the elements on your Web page, including images, links, forms, applets, and plug-ins.

Following the object hierarchy, you can refer to a function of a plug-in by referencing it via the name of the plug-in instance. If you want to call the `Play` function of the video plug-in, you could do so as follows:

```
<SCRIPT LANGUAGE="JavaScript">
<!--
function Play() {
    document.Video.play()
}
// -->
</SCRIPT>
```

Here HTML button controls are used to access the basic operations of the video plug-in, including play, stop, pause, fast forward, and reverse. The buttons use a JavaScript `onClick` event to call the related plug-in functions when selected:

```
<FORM>
<INPUT TYPE="button" Value=""
onClick="Play()">
</FORM>
```

To use custom graphics instead of button controls, you could use the `onClick` event of the anchor tag to call the `Play` function. To eliminate the border around the linked image, be sure to set the border value to 0:



ViewSonic® makes your bright ideas brilliant!



The PJ800 projects a sharp, crisp image even in well-lit rooms.

The new Macintosh® and PC compatible PJ800 is a 3-panel (1.3" each) LCD Projector that provides rich screen colors and eliminates the "wash out" typical on most 1-panel LCD projectors. Its eye-opening 800 x 600 true resolution brightens any presentation. And with Advanced Video Compression, you can get 1,024 x 768 resolution while the images stay as sharp as if they were not compressed. With a 200:1 contrast ratio, you can project anywhere from 30" to 300" diagonal with confidence. It comes complete with

PJ800
550 ANSI Lumens
3-panel 1.3" Active LCD
3,000 hour, 260W DC Metal Halide Lamp
800 x 600 (SVGA) or 1,024 x 768 w/Advanced Video Compression
Macintosh® & PC Compatible

a remote control and a 260 watt B.C. metal halide lamp that lasts up to five years with normal use. What a brilliant solution to your A/V needs.



Remote control included

Brilliant. But then, that's why ViewSonic is "The Display Technology" Company.™

ViewSonic backs the new PJ800 with the brilliance and value that have helped us explore and conquer new fields of visual excitement. In addition, the PJ800 is backed by our limited 3-year warranty on parts & labor.*

For more information call ViewSonic at (800) 888-8583 and ask for agent 6557, or visit our website at: www.viewsonic.com.

(909) 869-7976 Fax: (909) 869-7958 • Internet: www.viewsonic.com • Specifications subject to change without notice
© Copyright 1997, ViewSonic Corporation • All rights reserved • *90 Day Warranty on Lamp





**SATELLITE TV AND TURBO INTERNET™
NOW SERVED UP ON ONE DISH.**

(COOL, HUH?)

INTRODUCING DirecDuo™

Imagine two satellites deep in space. One is broadcasting all the greatest, wildest Web sites from the Internet, at blistering speeds up to 400 Kbps. The other transmits over 200 TV channels of your favorite sports, movies, news, family shows and more. Now imagine getting all of this content—enough to entertain a small village—right in your home, through just one dish.

WHOA...

With DirecDuo, the best of TV and the Internet finally converge. That's because DirecDuo brings you the fastest Internet access available nationwide from DirecPC™, plus hundreds of top-quality digital TV channels from DIRECTV® and USSB®. And, if you already subscribe to DirecPC, DIRECTV or USSB, you can upgrade to DirecDuo at a reduced cost.

So take advantage of everything DirecDuo has to dish out. Call 1-800-DIRECPC ext. 102 today for the retailer nearest you, or visit us on the Web at www.direcduo.com.



1-800-DIRECPC ext.102 or www.direcduo.com

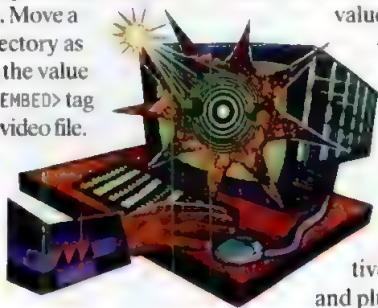
PC Tech

```
<A HREF="" onClick="Play()">
<IMG SRC="play.gif" WIDTH=25
HEIGHT=25 ALT="Play" BORDER=0>
</A>
```

Figure 2 shows the complete source for this example. Instead of using different functions for each plug-in operation I wanted to control, I used the new switch/case structure of JavaScript 1.2, which allowed me to streamline the code. Although the example is fairly basic, you can see how easy it is to call plug-in functions from JavaScript.

For the example to work properly, you need Navigator 4.0, an MPEG video saved with the filename hello.mpeg, and a video plug-in that supports the specified functions. Instead of trying to hunt down an MPEG video and a compatible plug-in, you'll probably want to modify this example to use your existing resources. To do this, copy the code in Figure 2 and save the file with an .htm extension. Move a video file to the same directory as the HTML page, changing the value of the SRC attribute of the <EMBED> tag to match the name of your video file.

Then check the plug-in documentation for the name of the functions used for playback and update the function calls as necessary.



CONNECTING A SCRIPT AND AN APPLET

The example above was designed specifically for Navigator 4.0, but you can easily create a Web page that will work with both Navigator and Internet Explorer. Here we'll see how to connect a script and an applet using a technique that should work with Navigator, Version 3.0 or later, and Internet Explorer, Version 3.02 or later, by exploiting the middle ground between JavaScript and JScript.

You can access applets from a script via the document object and the applet name defined in the <APPLET> tag, as shown in Figure 3. Because of Java security restrictions, you need to add the keyword MAYSCRIPT to the <APPLET> tag to enable the interaction between a script and an applet:

```
<APPLET CODE="ScrollText2"
NAME="scroll" WIDTH=600 HEIGHT=100
MAYSCRIPT>
```

Interestingly, you will use LiveConnect when you view the page with Navigator and ActiveX when you view it with Internet Explorer. Although they are different technologies, both LiveConnect and ActiveX access objects, such as controls, applets, and plug-ins, via the docu-

ment object. Unfortunately, when you move beyond interactions using scripts, you will need to tailor your solutions specifically for ActiveX or LiveConnect.

You could also call the applet methods directly from the body of the document (see Figure 4). In that way, you would streamline the code considerably and eliminate the need for a script in the page header. While it may seem that the Web page would no longer use JavaScript, don't be fooled by the lack of a script designator. The onClick event does invoke JavaScript.

For either example to work properly, you'll need the applet referenced in the source, so you should substitute a reference to an applet you use to scroll text on the screen. To update the example, copy the code in Figure 4 and save it with an .htm extension. Move the .CLASS file(s) for your applet to the same directory as the source for the HTML page, then change the value of the CODE attribute of the <APPLET> tag to match the main class file of the applet.

SUMMING IT ALL UP

LiveConnect and ActiveX are breakthrough technologies that let you create Web pages with interactive scripts, applets, controls, and plug-ins. To take advantage of the enhancements the technologies offer with minimal fuss, use JavaScript and JScript to access applet methods or plug-in functions. If you move beyond JavaScript and JScript interactions, you will need to break out your power tools. If you are an apt Java or C/C++ programmer, you will find that interactive controls, plug-ins, and applets will take your Web pages to a new level.

Because this is a fairly new area of Web publishing, you may run into problems that aren't documented. To keep up with new problems, tune in regularly to the Netscape ONE developer's area (developer.netscape.com/one) and to Microsoft's Site Builder Network (www.microsoft.com/sitebuilder). Look for the current FAQs or known-problems pages for the technology you want to work with, such as Netscape plug-ins, Java, ActiveX, or JavaScript. □

William Robert Stanek is the executive director of Global Internet Solutions and author of several books, including Web Publishing Unleashed, FrontPage 97 Unleashed, and Netscape ONE Developer's Guide. His eighth computer book, Increase Your Web Traffic in a Weekend, was published in July. He can be contacted at director@tvpress.com.

Get a DOWN LOAD of this.

w
w
w
.
p
c
m
a
g
.
c
o
m

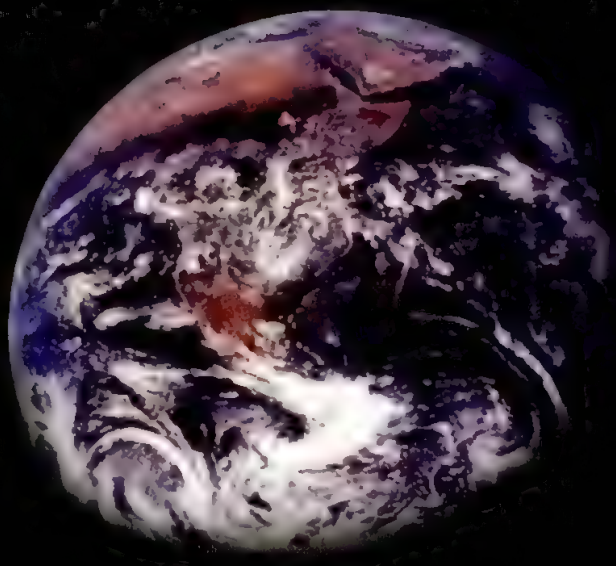
250 FREE DOWNLOADS
(to be precise)



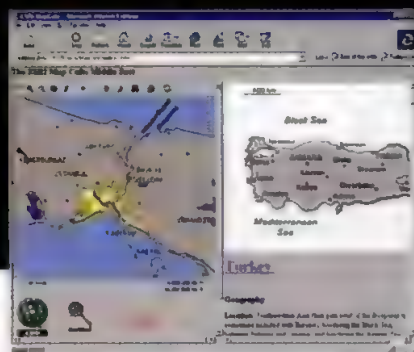
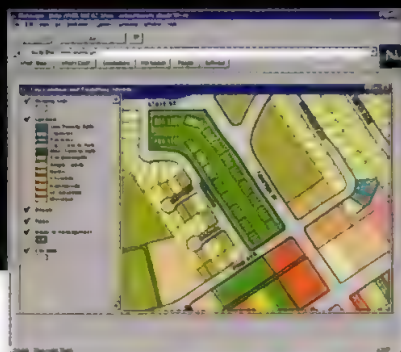
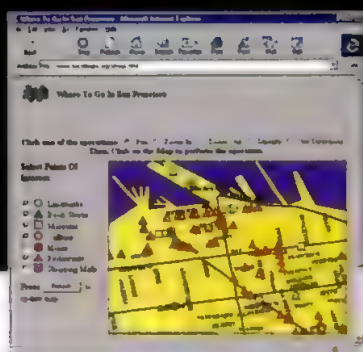
20 ZIFF DAVIS

The number of people who use
your mapping database is about to increase...

Publish
Maps on the
World Wide Web with ease!



...by about 20 Million



Introducing the ArcView Internet Map Server... The best way to put live maps on the Web!

Content. It's what the Web is all about. Now you can bring rich visual and intuitive information content to your Web site by adding live maps! The ArcView® Internet Map Server for ArcView GIS provides an out-of-the-box solution for placing maps on the Web.

Powerful—The ArcView Internet Map Server includes a prebuilt, interactive Java™ applet, the ESRI MapCafé™ that allows your Web site visitors to pan, zoom, identify map features and perform other interactive map exploration functions. Publishing maps on your Web site has never been easier.

Flexible—The ArcView Internet Map Server lets you publish maps derived from more than a dozen popular geographic data formats including ArcView GIS shapefiles, ARC/INFO® coverages, CAD drawings, and numerous image formats.

ArcView Internet Map Server...the solution of choice for publishing maps on the World Wide Web.



ESRI

1-800-447-9778

Fax: (909) 307-3051

E-mail: info@esri.com

Web: www.esri.com

International: (909) 793-2853,
extension 1235



ArcView Internet Map Server

GIS for Everyone®—Now on the World Wide Web

CIRCLE 240 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

Copyright © 1998 Environmental Systems Research Institute, Inc. All rights reserved. ESRI, ArcView, and MapCafé are trademarks of Environmental Systems Research Institute, Inc. ArcView and MapCafé are registered trademarks of Environmental Systems Research Institute, Inc. The Navigator/Navigator applet is a trademark of Netscape Communications Corporation. The Microsoft Explorer logo is a trademark of Microsoft Corporation. Other companies and products mentioned herein are trademarks or registered trademarks of their respective trademark owners.

User Concepts: The Core of Networked Environments

Understanding organizational differences between Windows 95, Windows NT, and Unix.

By Neil Randall

The old adage holds true: Appearances can be deceiving. Windows 95 and Windows NT 4.0 look a lot alike on the surface, and for the most part, they run the same programs, but they're worlds apart when it comes to the way they handle system users. In fact, Windows NT is much closer to the Unix user model than to the bare-bones Windows 95 model, even though some significant differences exist there too. If you use more than one of these systems, or if you're involved in systems administration in any way, understanding the technical differences in user models is crucial. But even if you're a novice, a good grounding in the user mechanisms of the three operating systems can help you sort out a variety of networking problems.

The fundamental distinction between the user concepts in Windows 95, Windows NT, and Unix is a simple one: User accounts are at the core of the latter two systems but entirely optional in Windows 95. When you start a Windows 95 machine, you might be presented with a user name/password dialog, but in many cases clicking the Cancel button will bypass it and the operating system will be fully operable. By contrast, a Windows NT or Unix system will boot only partially before demanding a user name and password. Both are designed as networking systems from the ground up, and if you're not registered as a user, you can't use the system.

In a networked operating system the user account system isolates the people who use the system from each other, from the essential components of the operating system, and from the network. Each user has access to only specific portions of the local machine and the network servers, with the remainder under the control of other users (all with their own restricted access) and a series of systems administrators who have varying degrees of access.

WINDOWS 95 USERS

On Windows 95 machines, a user logs on with a user name and password for two main reasons. First, each user has a *profile*, consisting

largely of preference settings (desktop wallpaper, fonts, and so on). Second, a log-on can connect the Windows 95 machine to a network, either peer-to-peer or server-based.

Through the Network icon in Control Panel, you can specify one of three Windows 95 log-ons: Client for Microsoft Networks, Client for NetWare Networks, or Windows Logon. The first logs your computer onto a Microsoft-based network—a peer-to-peer network—consisting of Windows 95, Windows for Workgroups, and DOS machines. On a peer-to-peer network, all machines can see each other and all the shared resources of all machines, unless they are password-protected. On these networks, user accounts reside on client (local) machines, rather than

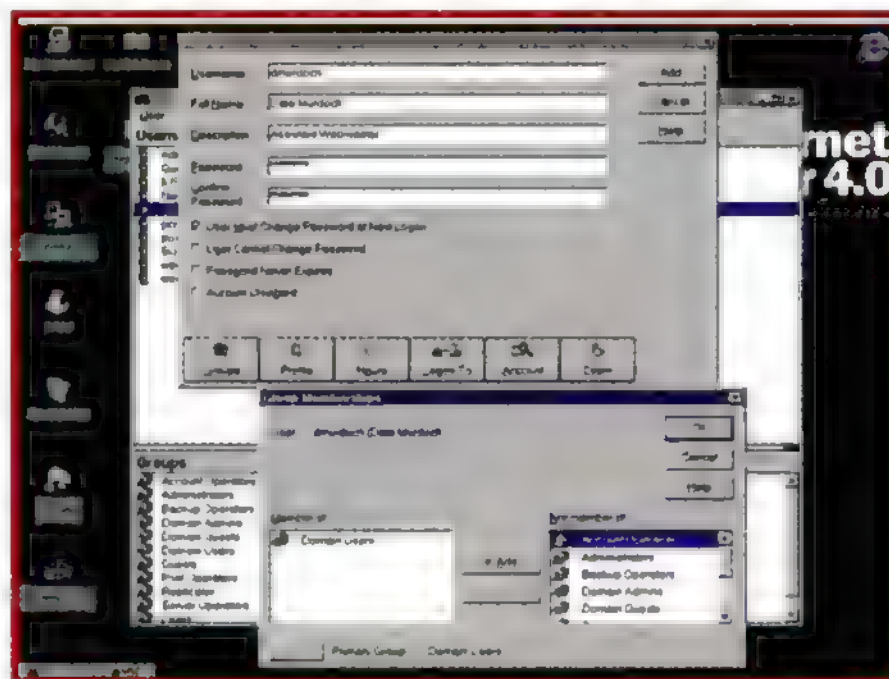


FIGURE 1: Windows NT's User Manager for Domains lets you specify options for each user you add to the network.

on a network server. The Microsoft Networks log-on is also used to connect Windows 95 stations to Windows NT networks (including domains), where the user account resides on the server machine. On such systems, access is established by the server administrator, and users can see only the network resources that the administrator specifies.

The second log-on choice, Client for NetWare Networks, connects the machine to a Novell network, with the user account on the relevant server.

In addition to network log-ons, Windows 95 also offers a log-on that affords some degree of user account customization. By se-

lecting the User Profiles tab from the Passwords icon in Control Panel, you can tell Windows 95 to let individual users establish their own preferences and desktop settings—colors, wallpaper, fonts, screen savers, Start menu programs, and the like. Windows 95 stores these settings in the User.dat file in that user's folder in C:\Windows\Profiles and also in the Registry, under the main key HKEY_CURRENT_USER. When you boot, entering your user name and password forces Windows 95 to load your profile. But while user profiles are convenient, they provide no security whatsoever. Anyone can gain access to a Windows 95 system, including all files and folders, simply by clicking Cancel at the log-on prompt. This is true even if you've used Access Control in the Network icon of Control Panel to specify user-level access control, because that option lets you hide your resources from prying eyes across a network, not from multiple users on the same machine.

UNIX USERS

In order to grasp fully the Windows NT user system, it's useful to understand how Unix treats the user concept. Windows NT is in many ways modeled on Unix, especially in its focus on network-centric activity and specific ownership of resources.

In Unix, adding a user means, in essence, creating a separate directory and subdirectories named for that user and granting varying degrees of ownership and permissions over the files and processes in that directory structure. Some systems allow users to browse (but not alter or add to) the overall directory structure of the Unix machine, but it's possible for an administrator to restrict users entirely to their specific areas of the system.

One user on a Unix system has full control over all files. That person is called the *superuser* and typically logs in with the user name *root*, the account for which is created when the operating system is installed. The superuser can change ownership of files, establish the system's host name, set TCP/IP and other network parameters, mount file systems and devices, and much more. The superuser account is analogous to the Administrator account in Windows NT, but there's no equivalent in Windows 95. Typically, only a very few system administrators on Unix systems are given the root password, because the account is too powerful to allow extensive access.

One of the tasks of the Unix administrator is to add new users. Programs such as *adduser* and other administrator tools automate the process,

but users can also be added manually. User information is typically contained in `etc/passwd`, and this file can be edited to add, delete, or modify user information. The file contains the following information about the user:

- **login name:** an identifying name, usually eight or fewer characters in length;
- **userid (UID):** a unique identifying number for each user (root is UID 0);
- **password:** encrypted when created using the `passwd` command, not to be edited directly;
- **contact information:** full name, phone number, and so forth, shown in finger requests (finger is a Unix command that allows you to get information about a machine and user);
- **login shell:** Unix has several possible shells, or command line interface programs; this command determines which Unix shell the user will see upon log-on;
- **group id (GID):** the unique identifying number of the group to which the user belongs;
- **home directory:** the directory and subdirectories where the user's files will be stored.

After editing the password file, root creates a home directory, using the `mkdir` command. This directory must be given the name specified in `etc/passwd`. Administrators try to segregate all their users in one or two parent directories, usually named `/usr`. Large installations might have several parent directories for users (`/u`, `/u2`, `/u3`...`/un` are common), and in some cases the user directories will actually be symbolic links (links to files that point to other files) to directories on other hard disks. Other administration activities for each user are establishing start-up files, setting an initial password (which the user will change on first log-on), establishing a directory for mail messages, setting the amount of disk space available to the user, and so on.

Every file in a Unix system has a single owner, and that owner can set permissions. Ownership is tied to users, and generally a user owns the files and subdirectories inside his home directory (he can be granted ownership of other files and directories by a superuser). Each file has a list of permissions established by the owner, and the `chmod` command (along with other file utilities) makes it possible to set the permission bits for the file. Each file has nine permission bits: The first three specify the owner's access, the second three specify the group's access, and the final three indicate access for everyone else. Each level of access has three associated permissions: *read*, *write*, or *execute*. Read permission lets a user open and view the file, and write permission allows modification of the file. Execute permission lets a user run the file (in the case of a program or shell script). A typical listing of a directory (via the `ls` command with the `-l` option) might

show files or directories prefaced as follows:

```
drwxr-xr-x  hsimpson
drwx-----  hsimpson
-rw-r-----  hsimpson
-rw-----  hsimpson
```

The first two items are directories (the first bit—a flag indicating whether an item is a directory—is set, which the `ls` command represents by the letter `d` in its output), and all grant read and write permission to the owner. The third file gives read permission to the group as well (denoted by the `r`), while the first and second give execute permission to the owner (indicated by the `x`). The topmost directory grants read and execute permission to everyone but write permission solely to the owner. In all likelihood, this is a publicly accessible directory, such as a Web site, which everyone can see but only the owner can modify.

WINDOWS NT USERS

Windows NT is closer to Unix than to Windows 95 in the way it handles users. Windows NT users have specific rights to system access, with certain classes of users able to perform different types of functions. Like Unix, Windows NT offers precise control over file access, but only with files installed on an NTFS (NT File System) partition. The user system and file permissions system, in fact, lie at the heart of network control and public access. The sophistication of these integrated systems make Windows NT a highly controllable environment and one that is in many ways more difficult even than Unix to set up and administer.

Windows NT creates three user accounts on installation. The first, Administrator, is the primary account for the entire system, and it has full control over everything, including files, folders (directories), and security. (Any user can be given Administrator privileges.) The second, Guest, is an account for anyone visiting the system, either from a LAN or across the Internet. The third account is for the initial user, who is usually the Administrator. Like the Unix root account, the Administrator account is too powerful to be used for daily activities, so Administrators typically also take a standard user account to prevent them from accidentally altering the system.

Each of these three accounts has different rights and permissions. In Windows NT, *rights* refers to a user's ability to perform specific activities, while *permissions*, as in Unix, refers to the ability of specific users to act upon a file or folder. Permissions are established on a folder-by-folder basis, but they can be fine-tuned to the level of specific files as well. The Administrator can go so far, for example, as to

restrict individual files to individual users, although more typically, as with FTP access or restricted Web or intranet access, a folder and its subfolders are given permissions that apply to an entire group of users. The Administrator group, for example, has full control over all files on the system, while other user groups can be given other permissions.

Windows NT has several permission types. *Read*, *Write*, *Execute*, and *Delete* are all straightforward. *Change* allows reading plus changing file attributes and displaying permissions. *List* lets a user view a directory. *Full Access* eliminates all restrictions, and *No Access* is self-explanatory. Permissions for a file or folder are set by means of the Properties dialog, which is accessible through My Computer or the Windows NT Explorer.

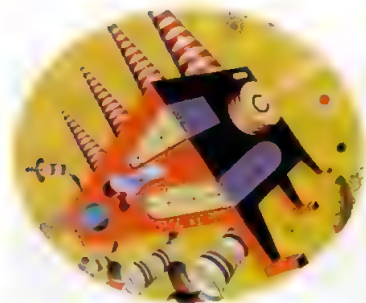
User rights in Windows NT can get complicated. The Administrator grants rights to individual users and to both local groups (a collection of users on a local workstation) and global groups (a collection of users across a network). User or group rights on a specific workstation apply only to that particular workstation, but rights on servers extend across a Windows NT domain system. Rights include such activities as accessing the computer from the network, backing up folders and files, logging on to a local workstation, shutting down the system, loading and unloading device drivers, logging on as a system service, updating the system time and date, and taking ownership of files, folders, or other items, such as printers. Each user is given certain rights when an account is created, but through the User Manager utility (or User Manager for Domains, on Windows NT Server) each user can have rights added or taken away. Groups can also be granted specific rights, and whenever a user is added to a group, that user assumes the group's rights and permissions.

As the Unix and Windows NT systems show, the user concept lies at the core of networked environments. Without a user name and password you can't log on to the system, and even with them, your access to the system's features and storage areas can be limited according to the system administrator's policies. Windows 95, like DOS and Windows 3.x, has almost none of this built-in security, which is why it's not taken nearly as seriously as a workstation environment. Corporations and organizations care about productivity, but they care about security, too, and only an operating system designed from the ground up as a networked system can offer the security they need. □

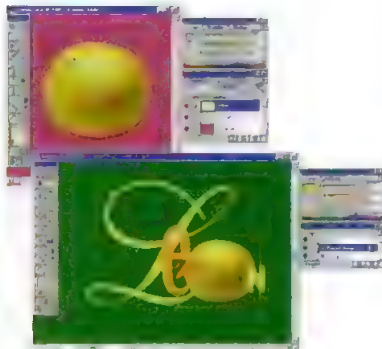
Neil Randall is a frequent contributor to PC Magazine and the author of *The Soul of the Internet (ITCP)*. He can be reached at nrandall@sprynet.com.

NEW ADOBE ILLUSTRATOR® 7.0 *for WINDOWS®*

PICTURE THE POSSIBILITIES



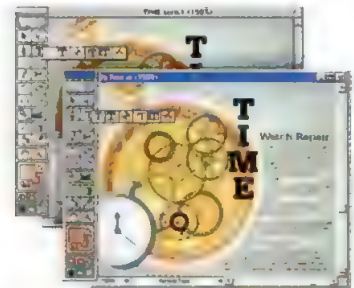
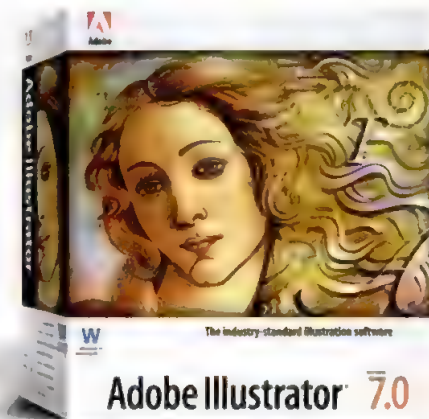
NO JOB IS TOO BIG OR TOO SMALL.
From the simplest graphics to the most complex artwork, new Adobe Illustrator 7.0 for Windows handles all your illustration jobs.



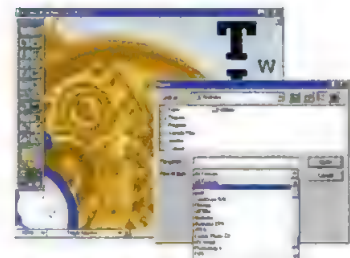
WORKS SEAMLESSLY WITH ADOBE® PHOTOSHOP® and Adobe PageMaker® like no other illustration software. You learn and work faster, with the same user interface, including shortcuts and menus. Even drag & drop among all three programs.



PRECISE CONTROL OF ARTWORK AND TYPE. Create, transform and align elements exactly the way you want. Adjustable "snap-to" guides and grids make layout design easier. You can even wrap text around any shape or run type along any line.



WINDOWS AND MACINTOSH®—SAME GREAT FEATURES. It's never been easier to share files across platforms with colleagues, clients and service bureaus.



UNMATCHED COMPATIBILITY. Input from anywhere, output for everywhere. Support for more than 20 image, graphics and text formats, including TIFF, WMF, CDR, PhotoCD, GIF89a and MS-Word—plus Adobe PostScript® printing, too.

AND GET \$50 BACK.

Just look what's possible now that new Adobe Illustrator 7.0 for Windows is here. And for a limited time it's as low as \$249 (*after \$50 rebate*) if you have CorelDRAW™, Adobe Photoshop, Adobe PageMaker, Micrografx® Designer, Macromedia® Freehand™, Canvas™ or ClarisDraw®. Get it now at your favorite place to buy software. Offer expires 9/1/97. For more information, call 800-649-3875, extension 31913.

Or visit www.adobe.com/prodindex/illustrator.



If you can *dream* it, you can *do* it®

©1997 Adobe Systems Incorporated. All rights reserved. Adobe, the Adobe logo, Adobe Illustrator, Photoshop, PageMaker, PostScript and "If you can dream it, you can do it" are trademarks of Adobe Systems Incorporated. Windows is a registered trademark of Microsoft Corporation, Inc. Macintosh is a registered trademark of Apple Computer, Inc., registered in the U.S. and other countries. All other trademarks are the property of the respective owners.

CIRCLE 274 ON READER SERVICE CARD

Face The Future

The First, The Best, The Only

multimedia LCD monitor is ready to blow your CRT monitor off the desk! Sceptre's FT15 15" LCD monitor (14.5" viewable) is flicker and distortion free, gives off negligible amounts of electrical emissions and zero magnetic radiation. Compared with a standard 17" CRT monitor, (yes, 17"!) the plug and play FT15 uses just one quarter the desktop real estate.

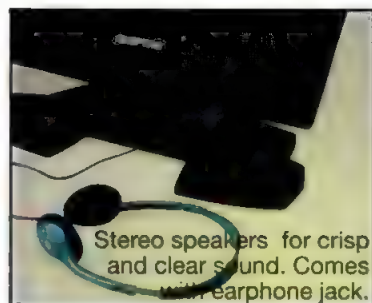
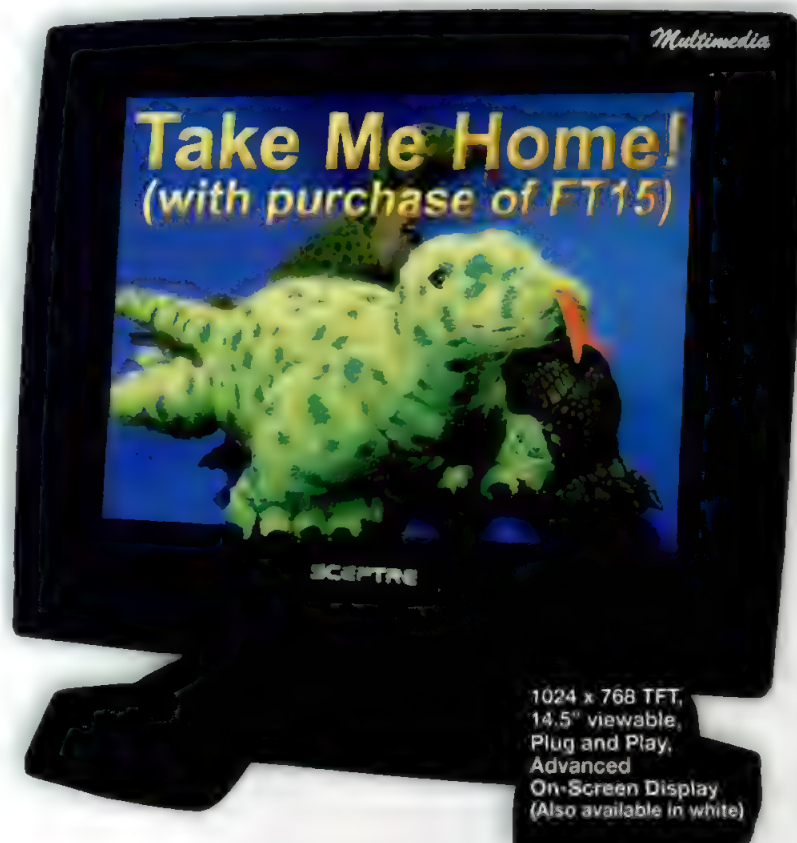
The FT15 is Sceptre's fourth generation flat panel LCD monitor. With that history of engineering excellence, plus the fact that Sceptre is an ISO 9001 manufacturer, you know that you are getting nothing but the best.

Period.

Call now to find out how to blast your viewing experience into the future.

800-788-2878

Check out our web site at:
www.sceptretech.com



Only
2 1/2"
Thin!



Sceptre's mascot, Brutus, is a Komodo dragon. Komodo dragons are on the endangered species list. Sceptre donates a portion of its revenues to the Center for the Reproduction of Endangered Species (CRES). Until August 31, 1997, with the purchase of any Sceptre LCD (11" & 12"), receive a 24" Brutus. Just send in a copy of your proof of purchase and this ad along with your warranty card.



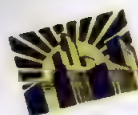
SCEPTRE®
EXCELLENCE FOR ALL THE WORLD TO SEE

Are you singin' the "Mislabeled, Misplaced, Misunderstood Diskette Blues" again?

Avery® Diskette Labels (Laser 5196™/Ink Jet 8196™)

Brothers and sisters, we hear you! When your disks aren't organized the world can be a very cold place. Thankfully, you can create Avery® diskette labels right on your computer, so all of this torment can be avoided. Take our advice and you'll be singing your favorite Disco hits in no time.

Don't make a "My new cards aren't ready... hand me your cocktail napkin." first impression.



DeeAnn Wood
Regional Manager
D.P. International

6025 W. Main Street
Bart, Illinois 50609

PH (818) 555-1610
FAX (818) 555-1616

Avery® Business Cards (Ink Jet 8377™/Laser 5377™)

A networking guru like you, wait on a print shop? Ha! Now you can create Avery® business cards on your laser or ink jet printer, which is great for customized designs in any quantity. Knowing this, wouldn't you rather just leave the napkins with the caterers?

You're cordially invited to try the "Hoity-Toity, Four Star, Invitation Only, Black Tie Affair" of address labels.

Ms. Judy Franklin
2352 Oakwood Drive
Bel Air, CA 35066

Avery® Clear Labels (Laser 56607™/Ink Jet 86607™)

Sorry if we sound snobbish. But if you want sophisticated labels that make a great impression, you've found them. Avery® clear labels virtually disappear on any envelope. Oh, we almost forgot. Pick a stamp that doesn't clash.

Working smarter instead of working harder. That's what Avery® is all about. Since preset layouts for most of our products already exist in Microsoft® Word, WordPerfect® and LabelPro®, it takes all the guesswork out of what used to be time consuming projects. And just about everything we make can be output on laser or ink jet printers. Making your work day a little easier. And hopefully, a little shorter.



AVERY®

How will you use us today?™

1-800-477-4404 ☎ 207
www.avery.com

JUST A REMINDER:
THE FASTER
THE PROCESSOR,
THE MORE CAREFULLY
DESIGNED
THE MEMORY HAS TO BE.



Kingston
TECHNOLOGY
COMPUTING WITHOUT LIMITS.™



Kingston invests millions in advanced memory test equipment to guarantee that our memory meets the performance requirements of tomorrow's fastest processors.

AS OTHER memory manufacturers will soon discover, the newer, faster processors are less forgiving when it comes to memory. The speed at which the processor and memory exchange data allows less margin for error. So Kingston® has created the industry's most rigorous design, manufacturing and testing procedures



www.kingston.com/ad

Want to find out the difference quality memory can make? Just visit our Web site at www.kingston.com/ad. Or call your preferred reseller. Or just call us toll-free at (800) 337-3806.



Kingston Technology Company, 17600 Newhope Street, Fountain Valley, CA 92708, USA, (714) 435-2600, Fax (714) 435-2699 © 1997 Kingston Technology Company All rights reserved
Computing Without Limits is a trademark of Kingston Technology Company All other trademarks and registered trademarks are the property of their respective owners

PC MAGAZINE CIRCLE 106 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

Virtual Private Networking With Windows NT

Using PPTP, you can now extend your LAN to anywhere in the world over the Internet.

By Neil Randall and Wayne Russell

Consider, if you will, the dilemma of the fictitious Randall & Russell Transatlantic Trading Co. The burgeoning enterprise is headquartered in a small town in Canada, where a little LAN based on Windows NT Server 4.0 supports its sales and marketing activities in North America. It also has a newly opened branch office in Manchester, England, from which it plans to take Europe by storm.

Naturally, the company wants to provide its staff in Manchester with full access to the corporate network and all the commercial applications the server runs. The question is, how? The traditional methods, a leased line or frame-relay connection, are effective but far too expensive for a small company. Of course, if the company had designed its network and core applications as an intranet, dial-up access via the Internet would be ideal, but like practically every other business in the world, Randall & Russell hasn't based its core systems on Internet technologies.

What we have here is the kind of annoying incompatibility that has always plagued computing. Two networks connected to the same vast communications system—the Internet—cannot talk directly to one another unless they use a special networking protocol (TCP/IP), which is so inconvenient that it's practically ruled out. The only option would seem to be spending tens of thousands of dollars every year for a private leased line.

The problem is that the Internet is fundamentally dependent on TCP/IP, whereas LANs normally use either IPX (Novell) or NetBEUI (Microsoft). It isn't possible for two IPX networks to communicate directly over a TCP/IP network, any more than it would be possible for two monolingual English speakers to communicate with each other through an intermediary who understood only Korean.

If you're using Windows NT Server 4.0, however, a solution is at hand. If you've installed or administered this OS, you may well

have come across the abbreviation PPTP, and that's the basis for the solution. Point-to-Point Tunneling Protocol is a new networking technology included with Windows NT 4.0 (beta support for Windows 95 was posted on the Microsoft site in May). PPTP allows a computer to connect to an IPX or NetBEUI network over the Internet and then work with the network as if the connection had been made by direct dial-in. Microsoft refers to this concept as a *virtual private network* (VPN), and it has undeniable benefits for companies in the same position as our fictitious Randall & Russell.

HOW PPTP WORKS

Networking protocols work by exchanging chunks of data called *packets*. A packet consists of control information specific to the protocol plus the actual data that needs to be sent, often called the *payload*. As users of the network, we are concerned only with the payload. As long as data is exchanged quickly

This process is called *tunneling*, presumably because it creates a passageway through the Internet connecting two points.

Apart from saving the cost of long-distance dial-ins, tunneling also enhances data security. Since the tunnel connects compatible protocols to a Windows NT network, the operating system can perform the extensive security checks it performs on the LAN itself. In this way, the connection can make use of Windows NT's user authentication through PAP (Password Authentication Protocol) or CHAP (Challenge Handshake Authentication Protocol). Furthermore, PPTP can transport data encrypted with RSA RC-4 or DES. If dial-in security is a crucial issue for the VPN, the server administrator can specify that the server will accept *only* PPTP packets over remote connection, but that would preclude using the server for public Web or FTP access. If more than one server is available, however, and if the highest security is needed, this is a viable option.

Yet even with all this security, the only special software required by the client is the PPTP protocol itself, plus a dial-up program that can connect to a VPN. And even that isn't necessary if the Internet service provider supports PPTP, in which case everything can transpire securely over a standard Point-to-Point Protocol (PPP) connection. Without a PPTP-capable provider, Windows NT provides the security through a double-dialing system.

PPTP CONTROL MESSAGES

Control message	Function
Start-Control-Connection-Request	Request to establish a control connection.
Start-Control-Connection-Reply	Response to the Start-Control-Connection-Request.
Echo-Request	"Keep-alive" message for the control connection.
Echo-Reply	Response to the Echo-Request.
Set-Link-Info	Sent by the network server to set PPP-negotiated options.
Stop-Control-Connection-Request	Command to close the control connection.
Stop-Control-Connection-Reply	Response to the Stop-Control-Connection-Request.

FIGURE 1: The PPTP control connection consists of a series of messages that establish the tunnel and keep it running.

enough and without error, we don't care what control information the protocol chooses to add for its own purposes. But the control information is vital and must be preserved intact if two computers are to communicate, whatever their connection medium.

PPTP works by wrapping native packets—IPX packets, for instance—inside TCP/IP packets. The entire IPX packet, including its control information, becomes the payload for a TCP/IP packet, which can then be transmitted via the Internet. Software at the other end then unwraps the packet and forwards it to the native protocol for normal processing.

THE PPTP PROCESS

Since the whole idea of remote access is to allow a client machine to dial into a server machine, the PPTP connection begins with the client, which uses the Windows NT Remote Access Service (RAS) in order to establish a PPP connection to an ISP. Then, with the PPP connection active and with the server connected to the Internet and acting as a RAS

server, the client uses RAS to perform a second dial-up. This time, the IP address (name or number) is specified in the phone number field, and the client uses a VPN port instead of a COM port to make the connection (VPN ports are added to both client and server during PPTP installation).

Dialing the IP address sends a request to the server to start the session. The client waits for the server to validate the user name and password and respond with a message that the connection is complete. At that point a PPTP channel is started, and the client can start tunneling packets to the serv-

FASTER
than a
speeding
bullet.

(We tested it)

w

w

w

.

p

c

m

a

g

.

c

o

m



DAVID ZIFF

PCTech Operating Systems

er. Because they can be IPX or NetBEUI packets, the server can perform its usual security tasks on them.

At the heart of the PPTP data exchange is the PPTP control connection, a series of control messages that establish and maintain the tunnel. The entire PPTP connection consists of only one TCP/IP connection, which requires a set of echo commands to keep it open while transactions occur. Figure 1 shows these messages and their intended functions.

INSTALLING PPTP

Establishing a PPTP connection requires a server running Windows NT Server 4.0 and a client running Windows NT 4.0 (Workstation or Server). Actually, Windows NT isn't necessary according to the open PPTP specification, but since Microsoft has implemented the protocol only on Windows NT 4.0, that operating system is required for the time being. You install PPTP the way you install any other protocol, through the Protocols tab in Control Panel's Network dialog box. Before performing the installation, however, you must install RAS. PPTP can't work without it.

After you select the protocol, Windows NT asks for the number of VPNs you wish to establish. The client machine needs only one, but on the server, you can set up as many as four. The number of VPNs is the number of PPTP connections you wish to allow on the server at any one time. The VPNs are then added to RAS through the Remote Access Setup dialog, which appears automatically at this point. Click Add and select the appropriate port. The ports will be labelled RASPTPMVPNx, where x is a number from one to four.

At this point, installing on the server and installing on the client differ. When first installed, each VPN port is configured as a dial-in port only. On a server, that is usually what you want. But for a client, you'll need to change it to a dial-out port, in order to be able to make the connection. The final step in installing PPTP on the server is to specify which protocols will be allowed through the VPNs into the server. If you're running only IPX protocols for the LAN or WAN, those are the only ones you need to allow; if you run NetBEUI as well, you'll need to check both. You can also specify different protocols for each port if you wish (see Figure 2).

PPTP'S FUTURE

The Point-to-Point Tunneling Protocol was developed in 1996 and submitted to the Internet Engineering Task Force by the PPTP Forum, a group that includes Ascend Communications, ECI Telematics, Micro-

soft, 3Com, and U.S. Robotics. To date, the protocol has been very successfully received, to the extent that Microsoft is taking its implementation a step further in Steelhead, a product that will appear later this year as an add-on to Windows NT Server 4.0 and in next year's Version 5.0.

Steelhead will continue the client-to-server implementation of PPTP begun in Windows NT Server 4.0, extending it with the addition of server-to-server capabilities. Not only will clients be able to establish secure connections to a corporate network, but network servers will be able to use the Internet as their connection technology. The cost savings to wide area networks (WANs) is obviously the main selling point here, because with server-to-server PPTP the dedicated leased lines connecting an organization's servers can become unnecessary. Of course, such connections are at the mercy of the Internet's bandwidth problems, but the cost savings may well prove more important.

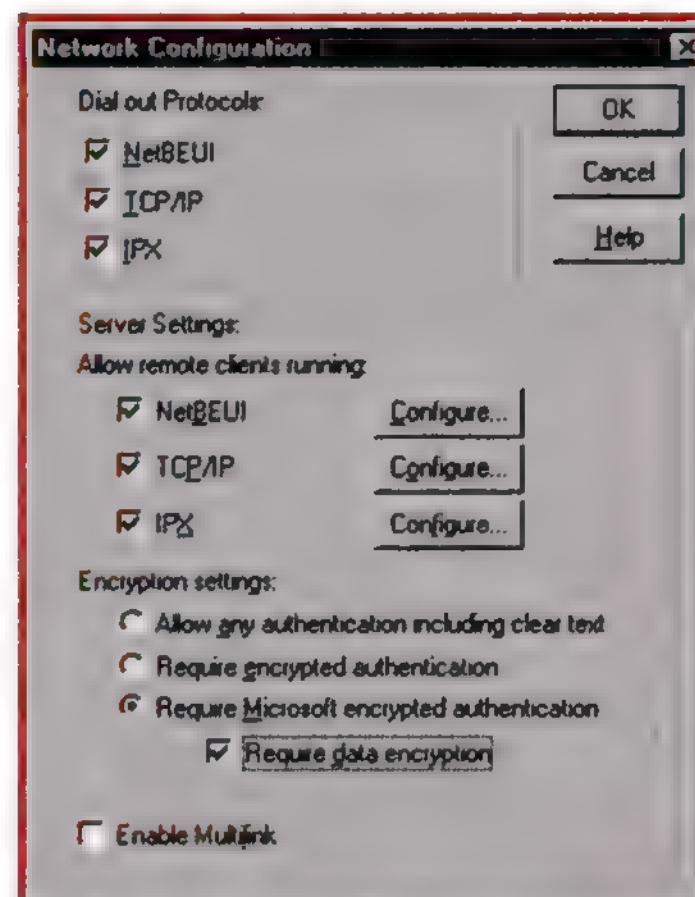


FIGURE 2: The Network Configuration dialog determines how your PPTP connections operate. You can specify encrypted authentication for greater security.

Microsoft's strength has always been its ability to adapt and extend existing technologies. With PPTP, it has adapted nothing less than the Internet, so that companies like Randall & Russell Transatlantic Trading can extend their businesses overseas without spending a fortune to connect the network. □

Neil Randall is a frequent contributor to PC Magazine and author of The Soul of the Internet (ITP). Wayne Russell is a freelance computer journalist and consultant specializing in AS/400 and Windows NT.

NOW

Copying EVERYTHING FROM YOUR OLD DRIVE TO YOUR **new drive**

IS THIS **easy.**

INTRODUCING **DriveCopy**,™ FROM
POWERQUEST® — THE **safest, easiest,**
AND MOST **affordable** WAY TO COPY
YOUR OLD HARD DRIVE TO YOUR
new hard drive IN MINUTES.

Remember when upgrading to a new hard drive was more painful than doing your income taxes and riskier than bungee jumping? Well, fortunately now there's DriveCopy, from PowerQuest. With a few simple steps, everything from your old hard drive is automatically copied to your new one without losing a single preference, setting, or byte of data. No re-installing, no data loss, no headaches. At just \$29.95, DriveCopy makes upgrading to a new drive more affordable and convenient than ever. All of the most common operating systems are supported by DriveCopy, including all versions of Windows 95, NT, 3.x, DOS, and OS/2. For more information, visit our Web site at www.powerquest.com.

Try DriveCopy for 60 days. If you're not completely satisfied, return it to PowerQuest and get your money back. Visit your local software reseller or call 1-800-720-0399.

Best Buy • CDW • CompUSA • Computer City • Egghead • Electronics Boutique
Fry's • Future Shop • J&R Computer World • Micro Center • Office Depot

© 1997 PowerQuest Corporation. All rights reserved. PowerQuest, PartitionMagic and DriveCopy are registered trademarks of PowerQuest Corporation. Patents pending.



FROM THE MAKERS OF PARTITIONMAGIC®

CIRCLE 125 ON READER SERVICE CARD

POWER®
PQ
QUEST

Software Product of the Year.



Windows Magazine
Summer 1997

The best remote access software you can buy for your PC, anywhere.

If you're already one of the millions of loyal LapLink® users, you don't need a magazine to tell you that it's the perfect link to the desktop or the network.

But if you're still undecided, you should know that LapLink has racked up more prestigious industry awards (twenty-nine of 'em, at last count) than every other remote access software package. Combined.

And now that LapLink is available for Windows® NT, you have every reason in the world to request one of our free, fully-functional trial packs.

Pick up the phone and dial 800-480-6643.
Or visit our website at www.laplink.com/ws.

It just might be the best move you'll make this year.

TRAVELING
SOFTWARE



©1997 Traveling Software, Inc. LapLink is a registered trademark of Traveling Software.

CIRCLE 088 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

Leave it to the
COOLEST
PROJECTOR
to keep you from sweating.

THE NEW LITEPRO® 720.
A PROJECTOR THAT'S INCREDIBLY
ADVANCED, YET AMAZINGLY EASY TO USE.
TRY IT 3 DAYS FOR THE PRICE OF 1:
1-800-294-6400 or www.infocus.com/pcm

This projector is cool. Literally.
It all starts with the efficient optical system.
It delivers intense, saturated colors with a
lower wattage lamp. Which requires a
smaller power supply.

Which means it's lighter, quieter,
and, of course, cooler. And since industry-
leading In Focus® projectors are the
easiest to use, you'll be cooler, too.

TRUE 800 x 600 SVGA RESOLUTION
POLYSILICON LCDs
450 LUMENS
ONLY 12 POUNDS
THE QUIETEST — 41dB

InFocus®

ELIMINATE FRAGMENTATION

From Your Entire Windows NT® Network...



...WITHOUT LEAVING YOUR DESK!

We know you don't have the time to physically run around to every workstation just to keep your system defragmented. That's why Diskeeper, with "Set It and Forget It"® ease, allows you to control all the defragmentation on all the drives throughout your network right from your administrator console.

Because your time is tight and your network is mission-critical, restoring and maintaining system performance must be automated.

Diskeeper, the fully automatic, fully network enabled defragmenter, is the only corporate solution.

Your job is to keep your network up and running. Not have your system up and running you.

So, don't accept a "runaround" solution. Send Diskeeper out to restore and maintain your system's speed and performance on your network.



"Diskeeper will make the System Administrator's life much, much easier."

—Marshall Goldberg, MICROSOFT

ORDER RISK FREE TODAY!

For best price, call your local Reseller or call

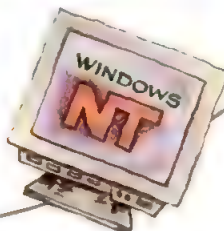
1-888-GET-DKNT

4 3 8 - 3 5 6 8

Suggested Retail Price: Workstation version \$75.00 Server version \$399.00



Executive
Software
www.execsoft.com



Why BUY a
non-network defragmenter
for Windows NT 4.0 when
DISKEEPER LITE
does the same job for

FREE!

Download:
www.diskeeper.com

Building MFC Extension DLLs in Visual C++

We write and package a sample extended class in a DLL to show you the process.

By Jeff Prosise

Little by little, experienced Windows programmers are migrating away from the Windows SDK and embracing newer Windows development environments that offer higher-level abstractions of the low-level machinery built into Windows. One of the primary beneficiaries of this move has been Microsoft's Visual C++, which relies on the MFC library to provide an object-oriented view of the Windows API.

MFC is a potent tool in the hands of experienced developers, but it is far from perfect. In fact, just about everyone I know who programs with MFC for a living has developed his or her own set of extensions, using MFC classes as base classes and deriving from them classes of their own. That, after all, is the power of C++. If a class doesn't do what you want it to do (and if it was properly designed to begin with), you're free to derive a new class from it and fix the parts you don't like.

Suppose you've written a set of MFC extensions that you'd like to share with other developers in your company. How do you pack-

age those extensions? You could distribute the source code files or hand out components that are compatible with Visual C++'s Component Gallery. Or you could be like MFC and package your extensions in DLLs. MFC extension DLLs export classes, just as conventional DLLs export functions. Any application that dynamically links to the MFC DLLs can also link dynamically to MFC extension DLLs. All you, the developer, have to do is include the necessary header files and add the DLL's import library to the application's link list.

How hard is it to write an MFC extension DLL? Not hard at all, with the support of Visual C++ and MFC. This article demonstrates how to create an MFC extension DLL that fixes a glaring deficiency in MFC's `CToolTipCtrl` class. It also shows how to write an application that uses the DLL. Once you see how easy it is, you may be tempted to write a few MFC extensions yourself.

WRITING AN MFC EXTENSION DLL

In theory, MFC's `CToolTipCtrl` class makes it easy to attach ToolTips to controls in a dialog

or to arbitrary regions of a window. (A *ToolTip* is a miniature help-text window that pops up when the mouse cursor pauses over a toolbar button or other UI object.) But there's a problem. Because `CToolTipCtrl::AddTool` doesn't automatically subclass the window that a ToolTip is attached to, mouse events have to be relayed manually to the ToolTip control. That usually means you have to subclass the window yourself.

The ToolTip control underlying a `CToolTipCtrl` object will do the subclassing on its own if you pass it the right flags—a feature the MFC design team apparently overlooked. Fortunately, the omission is not hard to rectify. Just derive a class from `CToolTipCtrl` and replace `CToolTipCtrl::AddTool` with a similar function that includes a `TTF_SUBCLASS` flag in the `uFlags` field of the `TOOLINFO` structure used in `TTM_ADDTOOL` messages. Better yet, replace it with two functions: one for adding ToolTips to child windows and another for adding ToolTips to rectangular window regions. The `AddTool` function supports both, but syntactically the two methods of creating a ToolTip are very different.

Figures 1 and 2 show the source code for a `CToolTipCtrl`-derived class named `CToolTipCtrlEx`. The derived class adds two functions to those it inherits from `CToolTipCtrl`: `AddWindow`, which attaches a ToolTip to a child window, and `AddRectangle`, which attaches a ToolTip to a rectangular portion of a window. Both functions use the `TTF_SUBCLASS` flag to

```
// ToolTip.h : header file
//

/////////////////////////////////////////////////////////////////
// CToolTipCtrlEx window

class AFX_EXT_CLASS CToolTipCtrlEx : public
CToolTipCtrl
{
// Construction
public:
    BOOL AddRectangle (CWnd* pWnd, LPCTSTR pszText,
        LPCRECT pRect, UINT nIDTool);
    BOOL AddWindow (CWnd* pWnd, LPCTSTR pszText);
    CToolTipCtrlEx();

// Attributes
public:

// Operations
public:
```

```
// Overrides
// ClassWizard generated virtual
// function overrides
//{{AFX_VIRTUAL(CToolTipCtrlEx)
//}}AFX_VIRTUAL

// Implementation
public:
    virtual ~CToolTipCtrlEx();

// Generated message map functions
protected:
    {{{AFX_MSG(CToolTipCtrlEx)
// NOTE - the ClassWizard will add and
// remove member functions here.
}}}AFX_MSG

    DECLARE_MESSAGE_MAP()
};
```

FIGURE 1: `CToolTipCtrlEx`'s header file.



PCTech Power Programming

make ToolTip creation as painless as possible. If `m_tooltipCtrl` is a `CToolTipCtrlEx` object, adding a ToolTip to a push button whose control ID is `IDC_BUTTON` is simple:

```
m_tooltipCtrl.AddWindow (
    GetDlgItem (IDC_BUTTON),
    "Enter tooltip text here!");
```

How do you wrap the `CToolTipCtrlEx` class into a DLL? Here are step-by-step instructions for Visual C++ 4.x:

1. Start Visual C++ and create a new project by selecting New from the File menu and double-clicking Project Workspace. In New Project Workspace's Name box, type "MfcExt" (without the quotation marks). In the Type box, select MFC AppWizard (dll). Then click the Create button.

2. In AppWizard's Step 1 dialog, answer the question "What type of DLL would you like to create?" by selecting "MFC Extension DLL (using shared MFC DLL)." Click the Finish button, and then click OK to generate the initial code for the DLL. Note the parenthetical "using shared MFC DLL" that appears after "MFC Extension DLL." When you write an MFC extension DLL, you don't have the option of linking statically to MFC. The DLL

must link dynamically to the MFC libraries. 3. Bring up ClassWizard and click the Add Class button. Select New to open the Create New Class dialog. In the Create New Class dialog, select `CToolTipCtrl` in the box labeled "Base class" and type "`CToolTipCtrlEx`" into the box labeled "Name." Use the Change button to change the filenames to `Tooltip.h` and `Tooltip.cpp`. (Changing the filenames isn't strictly necessary, but I did it to avoid long filenames.) Uncheck the "Add to Component Gallery" box to save some disk space. Click Create to instruct ClassWizard to perform the class derivation, and OK to dismiss ClassWizard.

4. Add the member functions `AddWindow` and `AddRectangle`, shown in Figure 2, to the class `CToolTipCtrlEx`. Be sure to make both functions public, since they will be accessed outside `CToolTipCtrlEx`. Tip: The easy way to add a member function to a class in Visual C++ is to right-click the class name in the ClassView window and select Add Function from the context menu.

5. In the ClassView window, double-click `CToolTipCtrlEx` in order to open the class's header file. Add `AFX_EXT_CLASS` to the class declaration right after the class keyword (see Figure 1).

6. Build the project. You'll produce two important files: the DLL itself (`Mfcext.dll`) and the DLL's import library (`Mfcext.lib`). An import library is basically a list of exported function names—or, in this case, a list of exported C++ classes. Linking to an import library allows an application to use classes exported from an MFC extension DLL as if the library containing the classes had been statically linked. Linking with `Mfcext.lib` also lets Windows know that the application requires `Mfcext.dll` in order to run.

USING AN MFC EXTENSION DLL

It's easy to create an application that uses `Mfcext.dll`. Just include the header file `Tooltip.h` in each class that uses `CToolTipCtrlEx` and add `Mfcext.lib` to the project's list of link libraries. Then use `CToolTipCtrlEx` as if it were an ordinary MFC class. Be sure to select "As a shared DLL" when you answer AppWizard's queries, so your application will link to MFC dynamically. You can add `Mfcext.lib` to the project's link list by choosing Settings from Visual C++'s Build menu, clicking the Link tab, and entering the path to `Mfcext.lib` in the box labeled "Object/library modules" (see Figure 3).

ToolTest is a sample application that dis-

SURVEYS • SALES ORDERS • TIME CARDS • REGISTRATIONS • INSURANCE CLAIMS • PATIENT HISTORY • CREDIT APPLICATIONS

TELEform — AUTOMATED DATA ENTRY

If your company enters information into a database, you need **TELEform**, the data collection solution.

Any Form...Every Format!

TELEform reads hand print from any form. It reads any data type from faxed, scanned, or even Internet-based forms. Create a form, print it, fax it, post it on your Web site. One form in any format, paper or electronic. Thousands of companies use **TELEform** to reduce their dependence on manual data entry.

Call today to find out more about
TELEform, your Total Data
Collection solution.

888-254-8917
www.cardiffsw.com

Cardiff Software

NAME	TITLE	OTHER
JAMES K. SMITH	PR	12345
FRANK G. SMITH	PR	12345

INFORMATION ABOUT THE EMPLOYEE

EMPLOYEE'S NAME: [Field]

EMPLOYEE'S TITLE: [Field]

EMPLOYEE'S ADDRESS: [Field]

EMPLOYEE'S PHONE: [Field]

EMPLOYEE'S FAX: [Field]

EMPLOYEE'S E-MAIL: [Field]

EMPLOYEE'S SOCIAL SECURITY: [Field]

EMPLOYEE'S DATE OF BIRTH: [Field]

EMPLOYEE'S DATE OF DEATH: [Field]

EMPLOYEE'S DATE OF ENTRY: [Field]

EMPLOYEE'S DATE OF EXIT: [Field]

EMPLOYEE'S DATE OF REENTRY: [Field]

EMPLOYEE'S DATE OF REEXIT: [Field]

EMPLOYEE'S DATE OF REENTRY: [Field]

EMPLOYEE'S DATE OF REEXIT: [Field]

EMPLOYMENT APPLICATIONS • TESTS AND EVALUATIONS • WARRANTY CARDS • READER RESPONSE

CIRCLE 177 ON READER SERVICE CARD

YOU WOULDN'T LET
YOUR BEETS GET **mixed up**

WITH YOUR POTATOES



SO WHY
LET YOUR **data**
SLOP INTO THE
operating systems
ON YOUR HARD DISK?

NOW YOU CAN **organize**
AND **protect** EVERYTHING
ON YOUR HARD DISK
WITH **PartitionMagic® 3.0!**

By dividing your hard disk into physically separate partitions, PartitionMagic lets you organize your hard disk to protect valuable data files from mixing with potentially sticky applications and operating systems. PartitionMagic also simplifies backups, especially to devices like ZIP™ drives, because you can just backup the partition containing the data you need. And with the move feature of PowerQuest MagicMover™ you can move applications from one partition to another without losing a single setting, preference, or file. For more information, visit our Web site at www.powerquest.com.

"PowerQuest's PartitionMagic is our choice for repartitioning a large hard disk."

Brian Nadel, *PC Magazine*

"In less than five minutes, I not only divvied up my hard drive, but changed my mind and divvied it up again ... it's easy to use." Steve Bass, *PC World*



Buy PartitionMagic 3.0 and get \$15 back from PowerQuest®. Visit your local software reseller or call 1-800-720-0399 for details.

Babbage's • Best Buy • CompUSA • Computer City • Egghead
Electronics Boutique • Fry's • J&R • Micro Center • Office Depot • Software Etc.

© 1997 PowerQuest Corporation. All rights reserved. PowerQuest and PartitionMagic are registered trademarks of PowerQuest Corporation. Patents pending.

POWER
PQ
QUEST

CIRCLE 176 ON READER SERVICE CARD

```
// ToolTip.cpp : implementation file
//

#include "stdafx.h"
#include "stdafx.h"
#include "ToolTip.h"

#ifdef _DEBUG
#define new DEBUG_NEW
#undef THIS_FILE
static char THIS_FILE[] = __FILE__;
#endif

// CToolTipCtrlEx

CToolTipCtrlEx::CToolTipCtrlEx()
{
}

CToolTipCtrlEx::~CToolTipCtrlEx()
{
}

BEGIN_MESSAGE_MAP(CToolTipCtrlEx, CToolTipCtrl)
//{{AFX_MSG_MAP(CToolTipCtrlEx)
// NOTE - the ClassWizard will add and remove
// mapping macros here.
//}}AFX_MSG_MAP
END_MESSAGE_MAP()

// CToolTipCtrlEx message handlers
```

```
BOOL CToolTipCtrlEx::AddWindow (CWnd* pWnd, LPCTSTR
pszText)
{
    TOOLINFO ti;
    ti.cbSize = sizeof (TOOLINFO);
    ti.uFlags = TTF_IDISHWND | TTF_SUBCLASS;
    ti.hwnd = pWnd->GetParent ()->GetSafeHwnd ();
    ti.uId = (UINT) pWnd->GetSafeHwnd ();
    ti.hinst = AfxGetInstanceHandle ();
    ti.lpszText= (LPCTSTR) pszText;

    return (BOOL) SendMessage (TTM_ADDTOOL, 0, (LPARAM)
&ti);
}

BOOL CToolTipCtrlEx::AddRectangle (CWnd* pWnd, LPCTSTR
pszText, LPCRECT pRect, UINT nIDTool)
{
    TOOLINFO ti;
    ti.cbSize = sizeof (TOOLINFO);
    ti.uFlags = TTF_SUBCLASS;
    ti.hwnd = pWnd->GetSafeHwnd ();
    ti.uId = nIDTool;
    ti.hinst = AfxGetInstanceHandle ();
    ti.lpszText= (LPCTSTR) pszText;
    ::CopyRect (&ti.rect, pRect);

    return (BOOL) SendMessage (TTM_ADDTOOL, 0, (LPARAM)
&ti);
}
```



FIGURE 2: *CToolTipCtrlEx's .cpp file.*

plays a single button in a dialog. It dynamically links to Mfcext.dll and uses CToolTipCtrlEx. The application is dialog-based, and the dialog class includes a CToolTipCtrlEx member variable named m_tooltipCtrl. The following code in the dialog's OnInitDialog function creates a ToolTip control and assigns a ToolTip to the dialog's push button:

```
m_tooltipCtrl.Create (this);
m_tooltipCtrl.AddWindowTool (
    GetDlgItem (IDC_EXIT),
    "Click here to close");
```

When the cursor pauses over the push button, "Click here to close" is displayed in a ToolTip window. Clicking the button closes the application.

ToolTest and Mfcext.dll are available for downloading, complete with source code, from PC Magazine Online (www.pcmag.com). Choose Downloads from the menu on the left side of the home page, then choose PC Tech Archives, then the file V16n15.zip. This file is also available on CompuServe in the Utilities/Tips forum (GO ZNT:TIPS). Our files are included in this archive. When you unzip the files (Mfcext.zip and Tooltest.zip), use PKUNZIP's -d switch so the directories recorded in the .ZIP files will

be unzipped, too. Before you run ToolTest, copy Mfcext.dll to the Windows system directory or to the directory where Tooltest.exe is stored. Otherwise, Windows may not be able to find Mfcext.dll when ToolTest is started. If you decide to build your own version of Tooltest.exe, modify the path name in the Project Settings dialog's "Object/library modules" box so Visual C++ will know where to find Mfcext.lib on your PC.

IN SUMMARY

Creating MFC extension DLLs is easy—once you know how to do so. When you distribute MFC extension DLLs to other developers, remember to provide header files describing the classes in the DLLs and the corresponding .LIB files, in addition to the DLLs themselves. Developers will then have everything they need to take advantage of the extensions you've put together. □

Jeff Prosise is a contributing editor of PC Magazine and author of Programming Windows 95 with MFC.

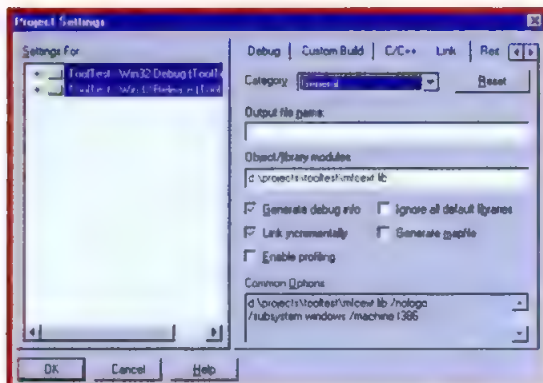


FIGURE 3: The Project Settings dialog, accessed from Visual C++'s Build menu, is where you can add MfcExt.lib to the project's list of link libraries.



D I A M O N D P R O 9 1 T X M

The DIAMONDTRON advantage is now even bigger, sharper and clearer.

Introducing the world's first .28mm, 21-inch (19.7" DVI*) aperture grille monitor.

The new Diamond Pro 91TXM (21" CRT/19.7" diagonal viewable image) from Mitsubishi Electronics represents an unprecedented improvement in the way you'll look at monitors from this moment on.



Bright, vivid colors with superb contrast. Razor-sharp focus due to Mitsubishi's enhanced electron gun. High refresh rate for flicker-free imagery. On-Screen Display system with intuitive front-panel controls. All in an ergonomic, compact enclosure that fits easily into any workspace.

Best of all, the Diamond Pro 91TXM is available at the estimated selling price of \$1,649, including a comprehensive 3-year warranty and support program to keep it working at peak efficiency. The new Diamond Pro 87TXM (17" CRT/16.0" diagonal viewable image) is also available, with an estimated selling price of \$829.

Get all the details today—both on-screen and off—by calling Mitsubishi Electronics at **1-800-843-2515** in the U.S. and Mexico. In Canada call **1-800-387-9630**. For immediate product specifications call Mitsubishi Qwikfax at **1-800-937-2094**. World Wide Web <http://www.mitsubishi-display.com>



MITSUBISHI
DISPLAY PRODUCTS

©1997 Mitsubishi Electronics America, Inc. DIAMONDTRON™ is a trademark of Mitsubishi Electric Corporation. Microsoft, Windows and the Windows logo are registered trademarks of Microsoft corporation. Mac and the Mac OS logo are trademarks of Apple Computer, Inc. * DVI: Diagonal viewable image

We know all about Dell, Gateway and Micron.



We replace them all the time.

Sys kicked butt and took names in performance tests in *PC Magazine*, *Computer Shopper* and on c|net. We have solutions for every user and budget. State-of-the-art 266MHz Pentium® II processor-based systems to 133MHz Pentium processor-based Value Editions. Custom-built from an amazing array of options—our place to yours—5 to 7 working days. Sys service sizzles too, with 24/7 phone support, first year on-site service, extended warranty options and money-back guarantee. No wonder thousands of canny users (NASA, JPL, MIT, etc.) have already done something brilliant.

Bought a computer from Sys instead of the other guys.



Nothing responds like Sys.

SYS VALUE EDITION systems BASE PRICE: \$1,234
SYS PERFORMANCE systems BASE PRICE: \$1,796
SYS PERFORMANCE systems (Pentium® Pro processor) BASE PRICE: \$2,396
SYS WORKSTATION BASE PRICE: \$5,995

800-613-9963

<http://www.systechnology.com>

CIRCLE 316 ON READER SERVICE CARD

Automate Tasks at Shutdown

ShutUp automates cleanup tasks and lets you run programs before shutting down.

By John Deurbrouck

You probably want your computer to perform certain tasks each time you boot up, and that's why Windows 95 includes the StartUp folder.

System shutdown is another time for routine tasks. For example, you may want to purge history lists, clean up your browser's cache, delete the files in your Temp directory, eject the CD in your CD-ROM drive, or run a small batch program. Perhaps your network administrator needs you to leave your computer on one night a week for backup, or maybe you like to do a full virus scan on the last day of each month. Wouldn't it be nice if your computer could display a reminder when you tried to shut down on those days?

Unfortunately, Windows 95 does not provide a shutdown folder, comparable to the StartUp folder, for automatic performance of such tasks. But this issue's utility, ShutUp, rectifies the omission. It can clean out selected history lists, eject CDs, delete the files in your Temp directory, and run specified programs before your computer shuts down. It also lets you schedule reminders for every day, one day a week, one day a month, or a specific date any time in the future.

You can obtain ShutUp by downloading it from PC Magazine Online or by mail. Refer to the sidebar "Getting the Files" for details. The source code for ShutUp, which was written in Microsoft Visual C++, is also provided for those interested in seeing how it works.

USING SHUTUP

Install ShutUp by copying its program files to your hard disk. You will probably want to place a shortcut into your StartUp folder. Uninstalling ShutUp is just as simple: Delete the program files and ShutUp.ini (which you

can find in the same directory). That's it, because ShutUp makes no Registry entries.

When you run ShutUp, it goes straight to your system tray. This is the little recessed area, typically at the lower right corner of your screen, that includes the Windows clock. All of ShutUp is controlled through this little icon. When you right-click on the ShutUp icon, you get a menu with several choices: Shutdown, Configure, Help, About ShutUp, and Exit.

ShutUp

ShutUp lets you automate cleanup tasks before shutdown. It can clean out selected history lists, eject CDs, delete the files in your Temp directory, and run specified programs before your computer shuts down. It also lets you schedule reminders for every day, one day a week, one day a month, or a specific date any time in the future.



REWRITING HISTORY

When you select the Configure option, you get the dialog box shown in Figure 1. The actions you choose in ShutUp's configuration box will occur at system shutdown.

The History Lists page (see Figure 1) lets you delete information retained by Windows and other software. The Start Button group contains four items: Documents, Find Files,

Find Computer, and Run. Checking Documents will clear the list of recently accessed documents when you shut down (you can see the list by selecting Documents from the Start menu). Note that any files you save during shutdown—for example, if Word prompts you to save your work after you've begun to shut down—will appear on the Documents list the next time you start your computer. Checking Find Files or Folders removes the history list in the Start menu's Find Files or Folders entry, and Find Computer removes the computer history list. The Run check box clears the Start menu's Run command. The Documents and Run lists contain shortcuts rather than files, so deleting them has no effect on the files.

The Internet section of the History Lists page controls the deletion of typed-in URLs from Netscape Navigator and Microsoft Internet Explorer. If you check the box for your browser, the next person using it will not be able to see the URLs you typed in. Select the Last User on Computer check box if more than one person uses your computer and you do not want the last one to be the default entry in the Windows 95 log-on dialog box.

THE LAUNCH FOLDER

The next page in the Configure ShutUp dialog box is the Launch page. This page lets you set up a folder of links to programs that will be executed at shutdown. You select the folder to use with the Browse button and put shortcuts into the folder using Windows Explorer. Then, as long as Enable is checked on the Launch page, ShutUp will start all shortcuts in this folder at each shutdown request.

After the programs are launched, ShutUp will wait a specified number of seconds before shutting down the computer. It is your responsibility to give the launch folder programs long enough to run before ShutUp initiates the actual shutdown. If ShutUp initiates shutdown while programs are still running, their behavior will be unpredictable.

The last item on the Launch page lets you specify whether a warning should appear under a peculiar circumstance. You can shut Windows down normally, using the Start button's Shut Down entry, even when ShutUp

FOR PROGRAMMERS ONLY ShutUp is written with Microsoft Visual C++ and MFC (Microsoft Foundation Classes). The full source code for ShutUp is available for downloading from PC Magazine Online for those interested in seeing how it works.

This utility demonstrates the following programming techniques:

- how to intercept, cancel, and initiate a Windows shutdown request;
- how to create a modal dialog box for a system tray application;
- how to create a directory selection control.

SUPPORT Help for PC Magazine's free utilities can be obtained in our online discussion areas, both on the World Wide Web (www.pcmag.com/discuss.htm) and on ZDNet in the Utilities section of ZDNet's TIPS Forum (GO ZNT:TIPS). The authors of current utilities generally visit this forum daily. You may find an answer to your question simply by reading the messages posted in the forum. If the author is not available and the forum sysops can't answer your question, the Utilities column editor, who also checks this forum each day, will contact the author for you.

WWW.PCMAG.COM

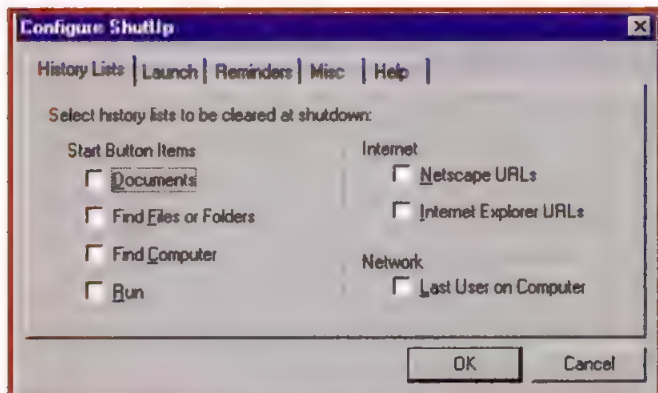


FIGURE 1: ShutUp's History Lists page lets you select history lists to be cleared at shutdown.

is loaded, because ShutUp will be asked by the system whether the shutdown can occur. If you've enabled the launch folder, ShutUp will cancel a shutdown you have started via the Windows interface, launch its programs, and then shut Windows down after its delay.

Let's say, though, that you have a document open in Microsoft Excel. When you select the Shut Down command, Windows 95 asks Excel if it's okay to shut down. Excel, in turn, asks you whether you want to save your modified document. If you say no, Excel allows the shutdown to proceed without first saving the document. ShutUp, though, cancels the shutdown in order to launch its programs. Then, when the time delay has expired, ShutUp shuts Windows down. Excel is asked again whether a shutdown is allowed, and you are presented again with the "Save changes to your work?" dialog box.

The Display Warning option on the Launch page of the configuration dialog box allows you to choose whether a reminder is shown, so you're not puzzled at seeing two separate Save dialog boxes from Excel. Once you and all who use your computer are used to this behavior, you can prevent the dialog box from appearing.

REMINDERS & OTHER THINGS

The Reminders page (see Figure 2) allows you to define messages of up to 256 characters to be displayed when your computer is shutting down. The Every Shutdown option displays a message each shutdown, the Weekly option displays a message on a particular day of the week, the Monthly option displays a message on a particular day of the month, and the Once option lets you pick a specific date. Reminders are handy if, for example, you have to leave your machine turned on every Wednesday for backup or on November 14 for a planned network upgrade.

The final bit of configuration information is

under the Misc page. The check boxes on this page let you eject your CD-ROM before shutdown and delete files from the Windows Temp directory, which is generally used for work files that are not needed from session to session. (Temporary files are usually deleted by the programs that create them, but sometimes—for example, when you turn off your computer

without initiating the Shutdown command, or when a system lockup forces you to reboot—programs can exit unexpectedly, leaving their temporary files behind.) The directory Windows uses as its temporary directory is displayed beneath the check box. This is the only situation in which ShutUp will delete actual files, so if you put permanent items into the Temp directory, they will be deleted when this option is checked.

THE SHUTUP SHUTDOWN

There are two ways to shut your computer down when ShutUp is running. You can use the normal Windows Shut Down command, as you have always done. That has the one possible side effect of causing applications to display potentially confusing multiple Save dialog boxes, as discussed above. The preferred alternative is to use ShutUp's Shutdown menu item by right-clicking on the ShutUp icon in the system tray. The latter approach is a tiny bit faster and allows ShutUp to direct your shutdown in a safe and direct manner.

If you have launched any programs through ShutUp, there will be a delay before the shutdown occurs, to give your programs time to run. A small dialog box will show you how long you have until shutdown and give you an opportunity to cancel. You can activate the time-delay feature and its cancellation option even when there's nothing you want to run by putting a do-nothing program into your launch folder. A zero-length batch file will serve the purpose, as will a link to ShutUp itself, since launching ShutUp twice will do nothing. You can set your time delay to, say, 600 seconds (10 minutes) and leave the timer counting down as you leave for the day, knowing that if you forgot to copy that .WAV file you wanted to take home, you can return to find the machine ready to go without rebooting. Still, it won't stay logged in all night. Don't use this feature if your presence at your desk is monitored by

your network log-on. You wouldn't want your boss to think you were staying 45 minutes late every day, after all.

LEARNING TO SHUTUP

When I started work on ShutUp, my original plan was to create a shutdown folder—intercept shutdown requests, monitor the programs in the shutdown folder so I'd know when they finished running, and then proceed with the shutdown. But monitoring programs turned out to be tricky and full of potential problems. What was to stop a user from launching something additional that was not in the shutdown folder? So instead, I built the most common shutdown tasks directly into ShutUp, where they could be handled cleanly, and added the launch folder, controlled by a timer, for people with special needs. I would like to thank Neil Rubenking for his permission to use code from his CDTray utility, which ejects CDs programmatically.

ShutUp still has to intercept, cancel, and initiate shutdown requests, however, and I'll explain how to do that. I'll also discuss how to create modal dialog boxes for tray applications and how to create a directory selection dialog box, a nonstandard but often needed control. ShutUp was written in Microsoft Visual C++ with Microsoft Foundation Classes (MFC).

SHUTDOWN MECHANICS

Shutting down Windows is straightforward from a user's point of view. When you select Shut Down from the Start menu, all running applications with unsaved files prompt you to save your work, and then Windows shuts down. The automatic polling of running applications is convenient, because you don't have to search for files with unsaved changes.

Windows implements this feature using two different Windows messages. The first is WM_QUERYENDSESSION, which Windows sends to every running application when a shutdown is initiated. Each application can abort the shutdown or allow it to occur. A common way for an application to handle the message is to see if any documents are open and need saving, and if so, send the user a Yes/No/Cancel dialog box.

The second message is WM_ENDSESSION, which is sent to every application following WM_QUERYENDSESSION. If any process forced the shutdown to be aborted, the wParam accompanying WM_ENDSESSION will be FALSE, an advisory that the Windows session was not terminated after all. Otherwise, the wParam will be TRUE, and running applications can do their final cleanup.

ShutUp must say no to WM_QUERYENDSESSION when it has programs to launch,

2115



2115

2115

2115

2115



2115

2115

2115

2115

It's cutting edge...

It's interactive...

It's PC Magazine CD...

**and every PC Magazine reader
should have it!**



Now there's an interactive companion to *PC Magazine* that gives you information you can't get through print alone. Using advanced multimedia technology, it lets you actually sample programs and products...see screens...

examine printout...hear playback... and listen in as the gurus of the industry discuss new technology.

It's **PC Magazine CD**, and it is guaranteed to help you know more, and do more, with new PC products and technologies.

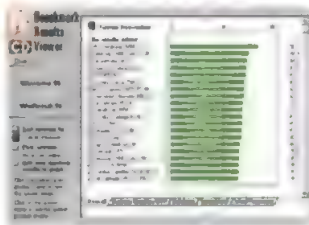
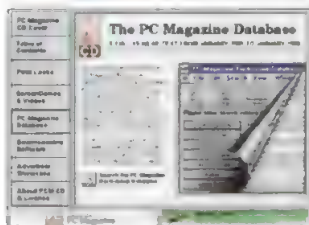
You get the complete text of the past year's issues of PC Magazine

Want to check out past reviews? Catch up on a topic you missed? *PC Magazine CD* gives you a searchable reference library of the past 12 months of *PC Magazine* with every quarterly release. With the hit of a key, the click of a screen, all the valuable buying advice and productivity help from *PC Magazine* will appear on your desktop.

Subscribe to *PC Magazine CD*, and by the end of one year you'll have two years' worth of back issues on disc — \$173.80 worth of *PC Magazine* — yours to access instantly. And they won't take up so much as one inch on your bookshelf!

Put your system to the test — with PC Magazine's Benchmark Tests!

Are you running at top speed? Is it time to upgrade? Now you can rate your own equipment with many of the same WinBench and Winstone tests our experts use. Every *PC Magazine CD* lets you access many of the best benchmark tests — without waiting for a trade show release, without the tedious downloads.



Get the edge in product purchasing and productivity! Guaranteed!

In past releases we've let you see and hear samples of the top 100 CDs, watch full-motion videos of the fastest Pentium dynamos, given you trial versions of new Windows software to try before you buy...and linked you straight to the coolest sites on the Net.



PC Magazine CD — it's the perfect addition to your knowledge base. Get it and you'll know more. You'll do more. You'll buy smarter. Or we'll give you your money back. Guaranteed!

Act now to save 30%!

Sign on for *PC Magazine CD* with this ad and you'll get 4 quarterly releases for \$49.95 — 30% off the price you'd pay if you bought them one-by-one. That's like getting nearly two of the discs free — and that's a great deal on a product that brings you the sight and sound of the products, programs and people you want to get to know.

Call 1-800-335-1195 now and mention priority code: 5Z7J

Use your Mastercard, Visa or American Express card and mention the priority code to start your one-year (4-release) subscription at this insider price! Or, visit our special order page at <http://subscribe.pcmagcd.com/deals>. Do it now.



Toll-free number is available in the U.S. and Canada. Other countries, call 303-665-8930, or fax your order to 303-604-7455.

**Get 4 Quarterly Releases For
\$49.95 — And Save 30%!
Call 1-800-335-1195**



PC MAGAZINE CD • P.O. Box 59494 • Boulder, CO 80322-9494 • <http://www.pcmagcd.com>

SYSTEM REQUIREMENTS: 486 or higher PC-compatible system, Windows® 3.1, 8MB RAM, double-speed CD-ROM drive. VGA monitor (256-color display recommended). Windows-compatible soundcard recommended for some functions. Please allow 60 days for delivery. Send payment in U.S. funds only. PC Magazine CD is \$72 in Canada; \$99 for all other foreign orders (includes airmail charges).

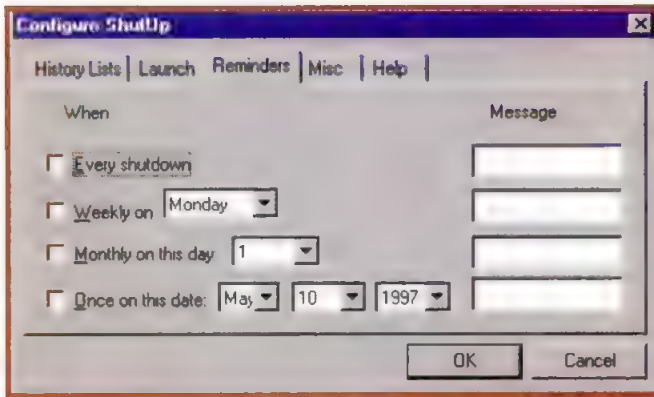


FIGURE 2: The Reminders page lets you define messages to be displayed at every shutdown, one day a week, one day a month, or on a specific day in the future.

because Windows does not allow new programs to be run after shutdown has begun. When ShutUp's timer counts all the way down, only then does ShutUp call `ExitWindows` to initiate the shutdown. If ShutUp has no programs to launch, it performs the actions you've requested before answering "yes" to `WM_QUERYENDSESSION`.

MODAL DIALOG BOXES

Modal dialog boxes can come in very handy. While you are modifying parameters and configuration details in a modal dialog box (such as the Project Options dialog box in Visual C++), the main window is inactive. Even if you click the mouse on the main window, Windows keeps the dialog box in sole charge of your interaction with the application. That means you don't have to do anything to prevent, for example, two simultaneous dialog boxes of the same sort from being displayed.

Since ShutUp runs in the system tray, however, Windows' normal modal dialog behavior is subverted. If no special precautions are taken, a system tray menu item that displays a modal dialog box could be invoked again and again, while the dialog box is still displayed on behalf of the application. The reason is subtle. Though the dialog box has a valid parent window handle (the hidden ShutUp main window), the context menu displayed by the tray icon is not truly a menu of the ShutUp application. Because of that, you can continue to interact with the system tray icon even while a modal dialog box is on display.

There are two possible ways to make the system behave as a user would expect. One is to display the dialog box and leave the menu item enabled, bringing the existing dialog box to the front when that menu item is chosen again. The alternative is to disable the menu item while the dialog box is displayed.

The first choice seems best at first. But

when a displayed dialog box is obscured behind a topmost window (like a help window with Always On Top selected), or when it is placed so far off-screen that it is nearly invisible, a user could select the enabled menu item over and over, never seeing a result. But if the menu item were disabled, the user might have to use Alt-Tab to find the lost window but at least would not

be left wondering why the dialog box was not showing up.

Once you know the problem exists, it's not hard to remedy. When a modal dialog box disables a main window, that main window is really disabled. Mouse clicks are ineffective, the window can't be moved, and so on. In ShutUp, I decided to disable all of the ShutUp menu items. I created, in my `CMainFrame` class, an integer called `mPrettyBusy`. Initialized to 0 by the constructor, it is set to `TRUE` before a dialog box is displayed through `DoModal` and reset to 0 when `DoModal` returns.

The function `OnUpdateXXX`, which is passed a pointer to each menu item when the menu is displayed, calls `Enable` based on the flag `mPrettyBusy`:

```
pCmdUI->Enable(mPrettyBusy?FALSE:TRUE);
```

This simple expedient makes a modal dialog box invoked from a tray menu work more as you'd expect them to and prevents awkward interactions from two simultaneous instances of the Configure dialog box.

SELECTING A FOLDER

Windows provides common dialog boxes for many tasks. Choosing a font, a color, a filename all have easy-to-use, prebuilt dialog boxes conveniently wrapped by MFC. But one common task has no such dialog box: selecting a folder. The `CFileDialog` class doesn't let you remove file-specific portions, so that only the directory boxes remain, and neither does the corresponding Windows dialog box.

There are several possible approaches to this problem, and I tried them all. One is to alter the dialog template itself, changing the physical appearance of the common dialog box. The advantage is that you can use prewritten (and tested) code to drive the dialog box; you don't have to write it yourself.

But unfortunately, it's not possible if you use the Windows 95 Explorer-style dialog box, as recommended by Microsoft. Although you can provide a custom template for this new dialog box, you cannot hide or move unwanted controls; all you can do is add new ones. Besides, Microsoft's technical literature warns that support for the old style will be discontinued at some point.

Another possibility is to write such a beast yourself. You can use a tree view control, populate it yourself, manage the nodes and drive and directory searching, handle all the mouse clicks—you get the idea. Frankly, it sounds like a long and boring week's work.

The best solution is to use a new shell function, `SHBrowseForFolder`. This function requires the use of OLE, so if you add it to an existing project there are a few steps you must carry out.

- Link to the library `Ole32.lib`.
- Include the header files `Winnls.h`, `Winnetwk.h`, `Shlobj.h` and `Objbase.h`.
- Finally, don't forget to call `CoInitialize` in your application's `InitInstance` and `CoUninitialize` in `ExitInstance`.

The code for `OnLaunchBrowse` is available from PC Magazine Online. Let's examine how it works. The first step is to place the directory the user previously chose into the `CString` `dfr`. Next a pointer to the shell's allocation function is stored in `pMalloc`. The pointer need not be freed, so it is stored in a static variable.

Let's skip ahead to the `BROWSEINFO` structure. This structure is filled in with data needed by `SHBrowseForFolder`. Since `SHBrowseForFolder` will create a modal dialog box, it needs a window handle. We give it the window handle of the dialog box. The next item is `pidlRoot`, an `ITEMIDLIST` that will be the root of the tree displayed by `SHBrowseForFolder`.

Browsing is permitted only in and below the root folder, so we clearly cannot use the default (previously chosen) directory name here. We want to allow the user to explore the entire system but return only actual folders. We set the flag `BIF_RETURNONLYFSDIRS` to prevent the user from selecting a folder like the Recycle Bin, and we specify `pidlRoot` as `NULL`. To set the default directory in this dialog box we must actually create a callback function. The ShutUp implementation of this function, `BCP`, is shown below:

```
static LPITEMIDLIST pidlGlobal;
int __stdcall BCP(HWND hwnd, UINT uMsg,
LPARAM lParam, LPARAM lpData) {
    if (uMsg==BFFM_INITIALIZED) {
        ::SendMessage(hwnd,
        BFFM_SETSELECTION,
```


Conference rooms, training rooms, not to mention the boardroom. Skylights, windows, lights everywhere.

No room is too bright

for my Proxima DP5800.



That's exactly the kind of performance I should expect from the brightest multimedia projector in its class. I mean, I can take my DP5800 into just about any room—with lights on, blinds open—and my presentation still looks awesome. I get unbelievable colors and the sharpness of SVGA resolution. All that, and it's portable, too. Get yourself a DP5800 from Proxima®. And see the light.



Proxima
DP5800

Contact us today for a free demo!
800-447-7692 ext. 439
www.proxima.com

Don't forget to ask about our Proxima Bright Lease™ program.




```
(WPARAM)FALSE,(LPARAM)
pidlGlobal); }
return 0;
}
```

When we call `SHBrowseForFolder`, we specified `pidlRoot` as `NULL`, the shell will browse using the desktop as the root of the displayed tree. To choose a default directory, our callback function must respond to the message `BFFM_INITIALIZED` by sending an `LPITEMIDLIST` (more on that below) to the browse dialog box. This will have the effect of selecting a default directory.

It is possible to do significant customization to this dialog by means of the callback function. You get messages when the dialog is initialized, each time the selection changes, and so on. As a response, you can enable or disable the OK button, alter the message text, or manipulate any controls you may have added. `ShutUp` handles only the message `BFFM_INITIALIZED`, so we can send `BFFM_SETSELECTION` before the dialog box is displayed, and in the message we provide an `LPITEMIDLIST`.

Normally we think of a directory name as a pathname, such as `D:\Shutup\Launch`. OLE, though, must deal with items that are not in the file system at all, like printers and the Recycle Bin. Therefore OLE includes the concept of a shell folder, which is the root of a directory tree that may contain file system folders, disk drives, the Recycle Bin, and so on. Specifying a specific item within such an enclosing folder requires an `ITEMIDLIST`. The corresponding pointer data types are `LP_SHELLFOLDER` and `LPITEMIDLIST`.

`ShutUp` always uses the Desktop as the root of its browse tree. To change `D:\Shutup\Launch` into a usable `ITEMIDLIST`, we will need to first get an `LP_SHELLFOLDER` for the desktop, then create an `LPITEMIDLIST`. Getting the desktop folder is simple: Just call `SHGetDesktop-`

`Folder`. We store this in `pFolder`. Note that the `Release` method of the returned folder must be called at the end of this function, thus: `pFolder->Release`. If you do not release the folder pointer, you will have memory leaks.

We must next create the `PIDL` from `pFolder` and a text string. Unfortunately, `ParseDisplayName`, which creates a `PIDL` (`LPITEMIDLIST`) from a display name and a shell folder pointer, takes only OLE strings, and we've

**Class member functions
have a hidden parameter,
the pointer `this`,
which precludes their use
as callbacks.**

saved an ASCII string. Therefore we call `MultiByteToWideChar` to convert, creating the OLE string in `olePath`. `pFolder->ParseDisplayName` then creates the `PIDL` we need and stores it in `pidlRelPath`. This `PIDL`, too, must be freed through the `pMalloc` pointer previously obtained.

We use the non-`NULL` value of `pidlRelPath` as a signal later to recognize the fact that the user did select a directory earlier. In that case, we set the `lpfn` member of the `BROWSEINFO` structure to point to `BCP`, our callback function. We also store `pidlRelPath` into a static variable called `pidlGlobal`, so `BCP` can use it.

Why isn't `BCP` a member function of `CPropLaunch`? Class member functions have a hidden parameter, the pointer `this`, which precludes their use as callbacks. Static member functions don't have this, but then you'd be

using static data anyway. Note the `__stdcall` calling convention for `BCP`. If you don't use the correct calling convention, your program will crash. Trust me.

Whether the callback function is used or not, eventually the user will select either OK or Cancel in the browse dialog box. If the user selects OK, `SHBrowseForFolder` returns a `PIDL` that is the location of the newly selected folder. It is true that the folder's name is returned in the buffer pointed to by the parameter `pszDisplayName` in the `BROWSEINFO` structure. This is, however, not a full path. Thus for a chosen folder of `D:\Shutup\Launchfolder`, `pszDisplayName` will contain only "Launchfolder." In order to obtain the full pathname as an ASCII string, we must get it from the returned `PIDL`. Call `SHGetPathFromIDList`, do your cleanup, and you're done.

You can adapt this code easily for your own use. Replace the line near the top that calls `GetDlgItemText` (to initialize the `CString` dir) with your own code and replace the line that calls `SetDlgItemText` with your code to process the returned directory. Now you have a general-purpose tool for directory browsing and selection.

`ShutUp`'s built-in cleanup utilities and reminders take care of most common preshutdown tasks. But if there's something special you need to do, you can use `ShutUp`'s launch folder and delay feature. I hope `ShutUp` makes Windows more convenient to use. If you're a programmer, I hope that the function `OnLaunchBrowse` makes life a little easier for you, too. □

John Deurbrouck is a C++ programmer with many years' experience writing Windows applications.

Sheryl Canter is the editor of the Utilities column and a contributing editor of PC Magazine.

GETTING THE FILES



Here's how you can access PC Magazine Online, where you'll find all our utilities and other PC Tech files:

ZDNET To join CompuServe/ZDNet (formerly ZiffNet), call 800-895-4596 (voice) and request the PMZ offer. CompuServe members can join ZDNet by typing `GO ZIFFMEM` at any CompuServe ! prompt. You can get the current utility by typing `GO FREEUTIL` at any CompuServe ! prompt. Other PC Tech Files are available individually, in the Utilities/Tips forum, and bundled within volume archive files.

INTERNET You can obtain the utility and an issue archive file by visiting our World Wide Web site at www.pcmag.com/download.

You can also get the files through anonymous FTP from our Internet site. The address is [ftp.zdnet.com](ftp://ftp.zdnet.com). Use the word anonymous as your log-on name and any of your e-mail addresses as the password. Look in the subdirectory `/pcmag/1997/0909/`. The volume archive filename is `v16n15.zip`. The utility and archive are compressed with PKZIP, Version 2.04.

BY FAX OR MAIL If you don't have a modem or Internet access, you can fax 508-368-0141 or write to *PC Magazine Utilities*, c/o Image Software Services, 67 Buena Vista St., Devens, MA 01432.

The programs presented in PC Magazine can be copied but are copyrighted. You may make copies for others if no charge is involved, but making copies or using any portion for any commercial purpose is strictly prohibited.

**State-of-the-art
Motherboards
accepts back
SIMMs and now
faster DIMMs**

how easy it is to assemble your new PC. Not only will you save hundreds of dollars on your purchase, when you're done you'll have something few PC owners have: the knowledge and certainty of how your computer works. You'll also have the confidence you need to upgrade or add parts in the future. Also includes our finest 8-bay mid-tower case featuring a third cooling fan. All you need to build your own multimedia system is this kit, a monitor and your operating system of choice.

YOU GET ALL THIS

- Cytrix 6x86MX P233 or
AMD-K5 MMX 233MHz or
Pentium MMX 233MHz or
IBM/Cyrix 6x86 P200+
- ATX PCI Motherboard
- 9-Bay ATX Case
- 16 MB EDO DRAM
- 3.0 or 4.3 GB EIDE Hard Disk

- BX or ZX CD-ROM
- 33.6 KB Voice/Faxmodem
- 16-Bit 3D Surround Sound
- Amplified Stereo Speakers
- 53 VIRGE 3D Video With 4MB
- Premium Keyboard
- PS/2 Two-Button Mouse
- 3.5" 1.44MB Floppy Drive
- 512KB Fixed-Disk Burst Cache

- 1 PCI and 4 ISA Slots
- ECP/EPP Parallel Port
- Two 16550 Serial Ports
- Two USB Bus Ports
- IrDA Infrared Connection
- Third Cooling Fan in Case
- 200-Watt Power Supply
- Motherboard, CPU, RAM and Floppy Installed and Tested

"The Tiger K6 233 was this roundup's leading performer..."

"...its Business Winstone score led the pack."
 "...its MMX numbers were unmatched."



PC Magazine Review of AMD-K5 Systems-June, 1995

Take Assembly-It-Yourself Multimedia Kits

Item #	Processor	CD-ROM Hard Disk	Price
A113-8801	Cyrix 6x86 PR200+	8X 3.0GB	\$849.99
A113-8806	Cyrix 6x86MX PR233	20X 3.0GB	\$1,049.99
A113-8705	AMD-K6 MMX 233MHz	20X 4.3GB	\$1,189.99
A113-8805	Pentium MMX 233MHz	20X 4.3GB	\$1,329.99

Sorry, but as prices are always changing on CPI's, we do not offer price protection on the retail prices rate.

16MB

\$79⁹⁹

32MB

\$159⁹⁹

Two 64MB SIMMs Or One 128MB SIMM **#PSB-1007 FAST PADE** Two 16MB SIMMs Or One 32MB SIMM **#PSB-1025 FAST PA**
#PSB-1023 EDO

ALSO AVAILABLE DIMMs: EDO or SDRAM, SAME PRICE!

Memory prices subject to change.

COMPARE AND SAVE!

Three Affordable Models Available, Including An Ideal Feature
2000MX With Brilliant 12.1" Active Matrix Screen!
32MB RAM, 12.1" (diagonal) Graphics! 1.2MB RAM, 12.1" Video RAM

Hot Color! The 12.1" SGVA Dual Scan or Active Matrix display delivers crisp, brilliant 800 x 600 resolution. • **16 or 32 MB EDO RAM** includes a 144-pin SO-DIMM socket. For Fast, Easy Do-It-Yourself Upgrades Up To 100MB! • **Duracell-Compatible Battery.** The modular NiMH battery pack is replaceable with any Duracell compatible pack. Built-in digital stereo speakers deliver exceptional 16-bit SoundBlaster compatible audio. Plus, two Type I, Type II or one Type II PCMCIA slots!

All Tiger Notebooks Include



**Custom
Systems
Available
Call For
Detailed
Prices!**

YEAR WARRANTY

- 12.1" Active Matrix or Dual Scan Display
- Windows 95 Pre-Installed
- Corel Win/Paint 3.0 & Pro-Install
- 256KB Pipeline Linear I/O Cache
- 16-Bit SoundMaster compatible audio
- PCMCIA slot—Type II or Type III
 - Built-in digital stereo speakers
- 128-MB PCI graphics cards with 12MB Random Access Memory
- 2V card support
- CD-ROM support



 • NTSC/TV Video out

- Universal-compatible NiMH battery
- Vx & Presentation Professional

8x86L PR168+
\$1799⁹⁹
#A113-5010

Pentium 166MMX
\$2549⁹⁹
#A113-5030

Pentium 200MMX
\$2799⁹⁹
#A113-5080

FREE WordPerfect 8

Item#	Processor	RAM/Exp. To	Hard Drive	CD-ROM	Screen	Price
A113-5010	Cyrix 6x86 PR166+	16MB EDO/80MB	1.3GB	10X	12.1" Dual Scan	\$1,799.99
A113-5030	Intel Pentium 166MHz	16MB EDO/80MB	1.6GB	10X	12.1" Active Matrix	\$2,549.99
A113-5040	Intel Pentium 200MHz	32MB EDO/80MB	2.0GB	10X	12.1" Active Matrix	\$2,799.99

VISIT WWW.TIGERBOOKS.COM FOR GREAT SELECTION AND PRICES ON OVER 15,000 COMPUTER BOOK TITLES!

TOSHIBA
220 CD5
\$1020⁹⁹

- 133MHZ Pentium
- 16KB in CPU
- 10X CD ROM
- 12.1" DS Display



T24-1520 TOSHIBA 220 CDS \$1929.99

COMPAQ
Armada
1500 Series

\$1849⁹⁹

- 120MHZ Pentium
- 10X CD ROM
- 11.3" DS Display

C150-1513 ARMADA 1500... \$1849⁹⁹

Hewlett-Packard
DeskJet
6500 Printer



N24-1027 HP Desk Jet 694C \$299.99

TO ORDER...ANYTIME
800-782-1434

...Or visit our web site at WWW.TIGERDIRECT.COM. We accept VISA, MasterCard, American Express, Discover and Diners Club. All products carry Tiger's 30-Day GUARANTEE against defects. Returns for defective exchange only. Call for more information and details on exact shipping charges. *All prices subject to change.*

FREE Tiger Catalog

Get a **FREE** subscription of the TigerDirect catalog—each issue features over 100 pages packed with new hardware, software, systems and accessories! You'll get the latest on the best that the computer industry has to offer, at the lowest prices!

800-782-1434

Create

EFFECTIVE

intriguing

Impressive

STUNNING

FLASHY DETAILED

VRML Images

with
DesignCAD 97

2D/3D CAD System for Windows 95 or Windows NT



*DesignCAD 97 makes
.jpg images and 3D
VRML files for use on
your web page!*

Your
Creativity
is the
only limit.

INTERNET READY

- Output JPG, TIF, and TGA files.
- Create 3D VRML files.
- E-mail directly from DesignCAD.

ANIMATION AND PRESENTATION

- True 3D texture mapping.
- Great animation with AVI support.
- New anti-aliasing.

SMART EDITING

- Dozens of innovative editing features to enhance your drawings.

3D SOLID MODELING

- Create virtually any 3D surface with surface construction tools.
- Boolean operations allow precise solid additions, subtractions.

CUSTOMIZATION

- Full keystroke and screen customization.
- OLE automation with Visual Basic and C++.

MORE...

- Direct scanner support with bitmap to vector conversion.
- Embed designs into other documents with Windows Clipboard and OLE-2 options.
- Read and save DWG, DXF, IGES, and HPGL file formats.
- DesignCAD Developer's Kit for creating special features.



only
\$499*

*Competitive upgrade \$299

CALL FOR
**FREE
DEMO
CD**

Call, fax, or e-mail your order to:

800/233-3223

Viagrafix

One American Way, Pryor, OK 74361

918/825-7555
fax: 918/825-6359
www.viagrafix.com
sales@viagrafix.com

H-6011-7

Keep Your Memories Alive Forever!



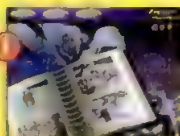
With Presto! PhotoAlbum

And Let the Fun Begin!

Presto! PhotoAlbum allows you to create your own personalized photo albums so you can organize, preserve and share your photos forever – digitally! Just add your favorite photos from digital cameras, scanners or the internet. Decorate them with frames, shadows, clip art, captions, textures and special effects. Record narratives for each photo or an entire page. Then share your album with family and friends via e-mail or post it to your web site. It's Fun & Easy!

HERE'S HOW IT WORKS:

1 From the Intro screen, select CREATE to start a new album, or EDIT to revise an existing one. The screen on right will appear ▶



2 Place photos in Presto! PhotoAlbum choosing from dozens of frames, textures and special effects (such as drop shadows, transparency, emboss and sketch), add clip art and other ornaments and sound such as music or narration

3 When you're done with your album, send it to your friends or family via e-mail you can post it on your web page, print it out, create a slide show, or even make wallpaper for your computer's desktop



Photo Browser allows you to place images captured from digital cameras, video cameras, scanners, photo CD, or the internet into your album

Toolbar allows you to move, rotate or resize objects, free-hand draw and add text in a straight line or along a curve

Choose from custom themes and textures, add special effects (such as drop shadows, emboss and sketch) and add clip art images

Now available at:



NewSoft

FOR MORE INFORMATION, CALL:

1-800-670-7266

OR VISIT US ON THE INTERNET AT:

<http://www.newsoftinc.com>

The power you've been waiting for
at a price you've only dreamed of.

**233
MHz**

**starting at
\$1,795**

The ALR Optima

2

You've waited for the power of
the Pentium® Pro processor.
You've waited for the
enhanced multimedia performance of
MMX™ technology. Your wait is over.

Introducing the ALR Optima2.



Powered by Intel's®
Pentium® II processor,
ALR's Optima2 delivers
both Pentium Pro power
and MMX technology,
bringing advanced desk-

top computing to new heights. Plus
with integrated audio, 64-bit video stan-
dard, the ALR's Optima2 is ready to
take on the latest in business multime-
dia applications... from international
video conferencing to full-blown
multimedia sales presentations.

To learn more about the
Optima2 or any member of
ALR's Optima Series... the
series that redefined
PCs with affordable
performance and
unprecedented
service and support,
please call ALR's
toll-free number
today.



The Optima Series of
desktop, slimline, and mini
tower systems are
designed with the latest in
Pentium® Pro, Pentium®,
and MMX™ technology.
We've added 64-bit or 64-
bit 3D graphics. And some
models even feature inte-
grated audio and USB
technology.

1-800-444-4ALR
<http://www.alr.com>



ALR®
Advanced Logic Research, Inc.

Monitors sold separately. ALR is on the Internet: CompuServe - @ALRINC, & America Online - Keyword ALR. Advanced Logic Research, Inc. 9401 Jarameno, Irvine, CA 92718 (714) 851-4770 FAX (714) 851-6240. Prices, configurations and specifications subject to change without notice. Systems shown with optional equipment. Pricing based on U.S. dollars. ALR is a registered trademark of Advanced Logic Research, Inc. Pentium logo and Intel trade logos are trademarks of Intel Corporation. All other brand and product names are trademarks or registered trademarks of their respective owners. © 1997 by ALR

CIRCLE 064 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

User-to-User

BY NEIL J. RUBENKING

Instant Backups

My laptop computer has a 1.2GB disk. While looking for a fast (that is, likely to get used!) way to back it up, I realized that my Jaz Drive was the answer.

Windows 95 comes with a new version of XCOPY called XCOPY32, which includes some new options. The /D parameter used to specify only files more recent than some date, such as /D:12-25-96 for those post-Christmas files. But when /D is used without the colon and date, XCOPY32 individually compares every file's date/time stamp, and it copies only those source files newer than the target copy.

The first time it ran, my backup batch file (Figure 1) took nearly an hour to replicate my hard disk's 10,000 files. But now it does a complete incremental backup in under a minute! No more excuses.

AL LOWE
Seattle, Washington

PC MAGAZINE: Just to be perfectly clear, note that the /D switch causes XCOPY to copy both new files and newer files. New files are files not present in the destination; newer files are files present in the destination with an older date/time stamp. Also, note that you don't have to use the XCOPY32 command explicitly. Simply entering XCOPY in a Windows 95 DOS box will launch XCOPY32. At most, a fraction of a second might be saved by entering XCOPY32 directly.

It is definitely worth your while to check out the command-line switches for this version of XCOPY, as many of them were not present in earlier DOS versions. To see them, simply enter XCOPY /? in a DOS box. If your standard DOS prompt is set to display 25 lines, the syntax description won't fit in one screen.

```
@echo off
cls
echo This batch file updates hard drive C: to Jaz
echo drive E:
echo by copying only changed or new files.
xcopy32 C:\ E:\ /C /D /R /S > C:\lastupd.log
rem           /S=include subdirectories
rem           /R=read only too
rem           /D=new or newer only
rem           /C=ignore errors
exit
```

FIGURE 1: This batch file keeps a Jaz Drive copy of hard disk files up-to-date by taking advantage of features added to XCOPY in Windows 95.

In that case, you can pipe the list through the MORE filter, thus:

```
XCOPY /? | MORE
```

You can optionally modify the MS-DOS Prompt window to display 43 or 50 lines. This will let you see all of XCOPY's switches, as well as making more of a directory listing visible at once. To do so, first launch the DOS prompt from the Start menu. If it occupies the full screen, press Alt-Enter to change it to a windowed display. Click on its System menu box and choose Properties from the System menu. On the Screen tab, you'll find a drop-down list labeled "Initial size." Change this setting to 43 lines or 50 lines. Click OK, close the MS-DOS Prompt window, and launch it again to see the change.

Selecting Your Sounds

Windows 95 doesn't give you many options for adding sounds to events. In Control Panel, you can change the sounds only for the open and close events for a few listed programs. You can also assign sounds to eight events (open, close, maximize, minimize, restore down, restore up, menu command, and menu pop-up) for all other programs, but it's not immediately obvious how to do this. The following procedure lets you assign a different .WAV file for each of the eight events (not only the open and close events) for any program:

1. Open the Registry Editor by choosing Start | Run | REGEDIT.
2. Expand the HKEY_CURRENT_USER key.
3. Expand the AppEvents key.
4. Expand the Schemes key.
5. Expand the Apps key.

6. To add a new program to the list, right-click on Apps and choose New | Key. Type a program name (for example, WIN-MINE).

7. Right-click on the new key you added and again choose New | Key.

8. Type the name of an event to which you would like to add sound. The names of the events you can choose are Open, Close, Maximize, Minimize, Restore-

Down, RestoreUp, MenuCommand, and MenuPopup.

9. Repeat the last two steps to add more events. When you're done, close the Registry Editor. Then open Control Panel and double-click on

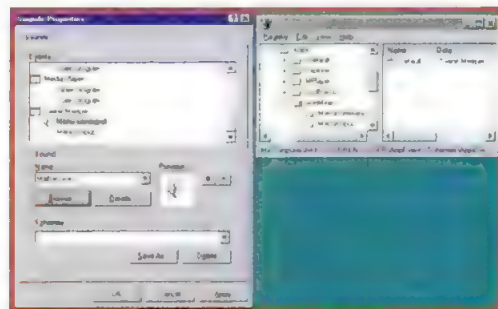


FIGURE 2: Use REGEDIT and the Sounds applet to associate a unique set of sound events to any program.

the Sounds icon. Scroll down the list until you find the new program you added.

Click on each of its events, and choose a sound for it from the sounds list or press Browse and find a different sound file. Click OK, and enjoy!

Note that if you associate a sound with the Open event, you won't hear the sound if you activate the program from the Start menu, through a shortcut, or with the Run command. The sound plays only if the program is opened by double-clicking its icon.

DOV RAMON
Sderot, Israel

PC MAGAZINE: To enable program-specific system sounds, you add the program's filename as a key name below the Apps key, omitting the .EXE extension. If you want a more descriptive name for the program to show up in the Sounds applet, select the main key and right-click on the (Default) value in the right-hand pane. Now enter the descriptive name and press OK. As Figure 2 shows, you can use any descriptive name you like; here we've used "Swine Meeper" instead of "Mine Sweeper."

Notice, too, that the Sounds applet displays descriptive names for the events, rather than the keywords you entered. For example, instead of MenuCommand and MenuPopup, it displays "Menu command" and "Menu popup." A misspelled keyword will show up in the Sounds applet exactly as you typed it—for example, "MenuComand." If you notice a spelling error, close the Sounds applet, correct the error using REGEDIT, and launch the Sounds applet again.



**COMPUTER
DISCOUNT
WAREHOUSE**

The right price.
The right advice.

Get mobile

TOSHIBA



Satellite 220CDS

- 133MHz Intel Pentium® processor
- 16MB EDO RAM standard, expandable to 144MB
- 1.34GB hard drive
- 10X CD-ROM drive
- 12.1" dual-scan color display

\$1959.45

CDW 89777

Tecra 510CDT

- 133MHz Intel Pentium® processor
- 16MB EDO RAM standard, 144MB maximum
- 2.1GB hard drive
- 10X CD-ROM drive
- 12.1" active-matrix SVGA color display
- 28.8K bps data/fax modem

\$2896.80

CDW 77241



Tecra 520CDT and 530CDT

- 166MHz Intel Pentium® processor with MMX technology
- 32MB EDO DRAM standard, expandable to 160MB
- 2.02GB hard drive
- 10X CD-ROM drive
- 12.1" active-matrix SVGA (520CDT) or XGA (530CDT) color display
- 33.6K bps internal data/fax modem

520CDT **\$4297.29** CDW 90355

530CDT **\$4696.39** CDW 90359



Tecra 730XCDT

- 150MHz Intel Pentium® processor with MMX® technology
- 16MB EDO RAM standard, 144MB maximum
- 2GB removable hard drive
- 10X CD-ROM drive
- 12.1" active-matrix TFT color display
- Integrated 28.8K bps (V.34) data/fax/voice modem

\$4179.11 CDW 80957



Tecra 740CDT

- 166MHz Intel Pentium® processor with MMX® technology
- 16MB EDO RAM standard, 144MB maximum
- 3GB removable hard drive
- 10X CD-ROM drive
- 13.3" active-matrix TFT color display
- Integrated 28.8K bps (V.34) data/fax/voice modem
- Includes Noteworthy Video Conferencing kit with color video camera, CardBus Capture Card and Intel ProShare software

\$5866.02 CDW 87964

\$6099.39 CDW 87965

Tecra 740CDT
■ Windows NT Workstation V4.0

**New! 1.85 lbs
mini-notebook!**



Libretto 50CT

- 75MHz Intel Pentium® processor
- 16MB EDO DRAM standard, expandable to 32MB
- 772MB hard drive
- 1.44MB external floppy drive
- PC Card
- 6.1" active-matrix color display

\$1959.45

CDW 90350

Satellite Pro 440CDX and 440CDT

- 133MHz Intel Pentium® processor with MMX technology
- 16MB EDO RAM standard, expandable to 144MB
- 1.34GB hard drive
- 10X CD-ROM drive
- 12.1" FastScan dual-scan (440CDX) or active-matrix SVGA (440CDT) color display
- 33.6K bps internal data/fax modem (440CDT only)

440CDX

\$2449.73 CDW 90351

440CDT

\$3149.69 CDW 90352



Satellite Pro 460CDT

- 166MHz Intel Pentium® processor with MMX technology
- 32MB EDO DRAM standard, expandable to 160MB
- 2.02GB hard drive
- 10X CD-ROM drive
- 12.1" active-matrix SVGA color display
- 33.6K bps internal data/fax modem

\$3837.78

CDW 90353

Portege 300CT

- 133MHz Intel Pentium® processor with MMX technology
- 32MB EDO DRAM standard, expandable to 64MB
- 1.51GB hard drive
- 10.4" active-matrix SVGA color display
- 33.6K bps internal data/fax modem

\$3424.88

Panoramic display!



Portege 300CDT **\$4237.92** CDW 77243

- 150MHz Intel Pentium® processor
- 16MB RAM
- 1.2GB hard drive
- 10X CD-ROM drive
- 11.3" active-matrix color display

800-326-4239

CDW offers FREE configuration of your new notebook purchase!

www.cdw.com
©1997 CDW Computer Services, Inc.
201 N. Milwaukee, Suite 1000, Milwaukee, WI 53204
POMC118K 09/97

COMPUTER DISCOUNT WAREHOUSE

with the
portable computing

leaders!

NEC

NEC Technologies

Versa 2600 Series

- 133MHz Intel Pentium® processor (2630CD)
- 150MHz Intel Pentium® processor with MMX technology (2650CD, 2650CDT)
- 16MB EDO RAM standard, 80MB maximum ■ 1.44GB hard drive
- 10X CD-ROM drive ■ 12.1" SVGA dual-scan (2630CD, 2650CD) or active-matrix color display (2650CDT) ■ NiMH battery (2630CD, 2650CD) ■ Lithium ion battery (2650CDT)



Versa 2630CD **\$1999.00** CDW 83593

- 133MHz Intel Pentium® processor ■ 12.1" SVGA dual-scan color display

Versa 2650CD **\$2499.00** CDW 86769

- 150MHz Intel Pentium® MMX processor ■ 12.1" SVGA dual-scan color display ■ 33.6K bps data/fax modem PC Card

Versa 2650CDT **\$3199.00** CDW 83595

- 150MHz Intel Pentium® MMX processor ■ 12.1" SVGA active-matrix color display ■ 33.6K bps data/fax modem PC Card



IBM® ThinkPad® 380 Series

Exceptional combination of technological function and affordable price

Price drop!



IBM ThinkPad 380 Series

Model	CPU	RAM	Hard drive	CD-ROM	Color display	Price	CDW
380	150MHz Pentium	16MB	1.0GB	Optional	12.1" dual-scan	\$1739.89	86302
380D	150MHz Pentium	16MB	1.35GB	8X	12.1" dual-scan	\$1999.50	86304
380D	150MHz Pentium MMX	16MB	2.1GB	8X	12.1" active matrix	\$3287.43	86305

IBM® ThinkPad® 560 and 560E Series

Fast performance and flexibility in a slim, lightweight notebook computer

Price drop!



IBM ThinkPad 560 and 560E Series

Model	CPU	RAM	Hard drive	Color display	Price	CDW
560	133MHz Pentium	8MB	2.1GB	11.3" dual scan	\$1936.33	81184
560	133MHz Pentium	8MB	2.1GB	12.1" active matrix	\$3789.45	81186
560E	150MHz Pentium MMX	16MB	2.1GB	11.3" dual scan	\$2599.86	89290
560E	166MHz Pentium MMX	16MB	2.1GB	12.1" active matrix	\$4186.26	89291

COMPAQ

FREE!

modem with purchase!*

* Receive a FREE 33.6K bps PC Card modem (CDW 54670) with your Compaq Armada 1130. www.basc.com/suppcom.htm



Armada 1130T

Exceptional performance and value

- 120MHz Intel Pentium® processor ■ 16MB RAM standard, expandable to 48MB ■ 1.0GB hard drive ■ 10.4" active-matrix SVGA color display

1130T **\$1199.00** CDW 79758

Our lowest price ever!



Armada 1500 Series

All-in-one approach to business

- Includes 33.6K bps modem

Compaq Armada 1500 Series

Model	CPU	RAM	Hard drive	CD-ROM	Color display	Price	CDW
1510DM	120MHz Pentium	16MB	1GB	10X	11.3" dual-scan	\$1799.30	87073
1528DM	133MHz Pentium	16MB	1GB	10X	11.3" dual-scan	\$1989.47	87072
1530DM	133MHz Pentium MMX	16MB	1.4GB	10X	12.1" dual-scan	\$2899.00	90958
1550DMT	133MHz Pentium	16MB	1.4GB	10X	12.1" active matrix	\$3199.00	87070
1580DMT	150MHz Pentium MMX	16MB	2.1GB	10X	12.1" active matrix	\$3699.00	90959



Armada 4100 Series

Versatile multimedia notebook

Compaq Armada 4100 Series

Model	CPU	RAM	Hard drive	Color display	Price	CDW
4120	120MHz Pentium	16MB	1.0GB	11.3" dual-scan	\$1299.00	71114
4130T	133MHz Pentium	16MB	1.0GB	11.8" active matrix	\$2497.23	71116
4131T	133MHz Pentium	16MB	1.4GB	12.1" active matrix	\$2849.00	80775
4150	150MHz Pentium MMX	16MB	1.6GB	12.1" dual-scan	\$2999.00	90960
4160T	166MHz Pentium MMX	16MB	2GB	12.1" active matrix	\$3999.00	90961

CDW® offers competitive business equipment leases.

800-326-4239

www.cdw.com/pcg

©1997 CDW Computer Services, Inc.
2000 N. Milwaukee Avenue, Vernon Hills, IL 60069
PCW97380 3/97



Check out these HOT BUY5!!

Buy any computer and pick up Symantec's Norton Internet Suite or Norton Antivirus for **HALF-PRICE!**



\$34.32
CDW 90890



\$35.89
CDW 90888



2008 Milwaukee Avenue, Vernon Hills, IL 60069
P(630) 398-1799

computers need more!

OKIDATA® Price Drop!

Okipage 4w



- 600 dpi resolution ■ 4 ppm print speed
- Unlimited fonts through Windows ■ Standard parallel IEEE 1284 bi-directional interface
- Plug and Play (PnP) compatible
- 1-year limited warranty, 5-year on LED printhead

\$199.00 CDW 70775

Okipage 4w toner cartridge
\$21.55 CDW 72091

CLARIS FileMaker Pro V3.0

For Windows V3.1, NT and 95

Complete Your Suite! Only **\$89.01** Competitive Upg CDW 70924*

The commanding power of FileMaker Pro V3.0 drives Office Suites such as:

Microsoft Office, Corel Office Professional, Lotus SmartSuite and ClarisWorks* to their full potential. Simple to use tools like ready-to-use templates, text formatting, buttons and scripting make it easy to develop your own custom solutions.

Full Version

\$175.48 CDW 70823

*Promotional pricing available for current users of Microsoft Office, Lotus SmartSuite, Corel Office Professional or ClarisWorks. Offer ends 6/1/98.

CHEYENNE ARCserve 6 For Windows NT



ARCserve 6 for Windows NT and its storage options provide a scalable solution to meet your critical data storage management needs. This

multitasking data management software solution offers advanced capabilities such as centralized administration, remote management and intelligent alert notification. Plus, it's designed to backup and restore data across single or multi-site Windows NT enterprises.

Workstation edition **\$174.33** CDW 73290

Single server edition **\$457.50** CDW 72681

Enterprise edition **\$819.18** CDW 71960

WINDOWS AND DOS SOFTWARE

Adaptive Easy-CD PRO WIN	\$229.88	Intuit Quicken Deluxe V8.0 WIN CD	\$98.41
Adobe Acrobat 3.0 WIN/NT CD	\$49.47	Lotus 1-2-3 V4.0 DOS upg	\$94.53
Autodesk AutoCAD LT V2.0 WIN	\$239.17	Lotus 1-2-3 V5.0 WIN	\$299.56
Autodesk dBASE V5.0 WIN	\$316.60	Lotus 1-2-3 V5.0 WIN spec upg	\$94.07
Autodesk Paradox V7.0 WIN	\$324.56	Lotus Approach V3.0 WIN	\$92.80
Autodesk Paradox V7.0 WIN CD	\$326.80	Lotus cc-Mail Mobile V8.0 WIN	\$125.33
Autodesk Turbo Pascal V7.0 DOS	\$115.04	Lotus cc-Mail R8 Web CD	\$125.86
Autodesk Turbo Pascal V7.0 WIN upg	\$91.96	Lotus cc-Mail V2.2 Mobile WIN	\$129.30
Autodesk Visual dBASE Pro V5.5	\$299.60	Lotus cc-Mail V8.1 System Pack univ CD	\$125.96
Autodesk Visual dBASE V5.5 client/server CD	\$299.34	Lotus cc-Mail V8.1 System Pack upg CD	\$82.71
CA Clipper V5.3 DOS CD	\$138.87	Lotus ScreenCam V2.0 WIN	\$92.80
Caere OmniPage Pro V6.0 WIN	\$499.12	Macromedia Fontographer 4 WIN CD	\$314.38
Caere OmniPage Pro V6.0 WIN upg	\$109.85		
Caere WordScan Plus V4.0 WIN	\$364.80		
ClearDraw V1.0 WIN	\$113.73		
Clear allCLEAR Flowcharting V3.0 WIN	\$160.35		
Clear OrgChart V2.0 WIN	\$45.48		
Connect RAM Doubler for WIN	\$35.89		
Corel Gallery 2 WIN CD	\$35.89		
Corel MEGA GALLERY CD	\$62.15		
Corel Office Pro WIN CD	\$279.37		
Corel Office Pro WIN compers upg CD	\$179.47		
Corel Office Pro WIN NT CD	\$1546.13		
Corel Quattro Pro V6.0 WIN CD	\$82.15		
Corel Stock Photo Library 1 WIN CD	\$82.15		
Corel Stock Photo Library 2 WIN CD	\$82.15		
Corel Ventura V5.0 WIN vers upg CD	\$85.59		
Corel Ventura V7.0 comparison upg WIN CD	\$218.51		
Corel WordPerfect Suite V5.2 DOS	\$246.23		
Corel WordPerfect Suite WIN 3.5 CD	\$277.14		
Corel WordPerfect Suite WIN CD	\$239.34		
Corel WordPerfect Suite WIN upg 3.5 CD	\$134.26		
Corel WordPerfect Suite WIN upg CD	\$92.00		
Corel WordPerfect V5.1 DOS	\$239.70		
Corel WordPerfect V5.1 DOS upg	\$86.84		
Corel WordPerfect V5.1 DOS upg CD	\$239.55		
Corel WordPerfect V8.1 DOS upg	\$89.74		
CorelDRAW V3.0 WIN CD	\$81.96		
CorelDRAW V4.0 WIN CD	\$81.84		
CorelDRAW V5.0 from V4.0 WIN upg CD	\$89.87		
CorelDRAW V5.0 WIN CD	\$178.31		

Microsoft Visual Studio 97 Professional Edition

Up to **\$339.37** CDW 70924*

Delorme Street Atlas V3.0 WIN CD \$39.84 || Fractal Design Desktop V2.0 WIN | \$127.00 |
Fractal Design Expression Companion Upg WIN CD	\$42.40
Fractal Design Painter V4.0 WIN	\$329.63
Guideline V2.5 WIN	\$168.14
id Software Doom II CD	\$36.91

WINDOWS 95 SOFTWARE

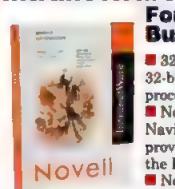
Adaptive Easy-CD PRO WIN95	\$229.19	Microsoft Project V4.1 WIN95 upg CD	\$129.14
Adobe Acrobat 3.0 WIN95/NT CD	\$178.01	Microsoft Publisher 97 CD WIN95	\$90.28
Adobe Illustrator V7.0 comp upg WIN95/NT CD	\$265.73	Microsoft Team Manager 97 CD WIN95/NT	\$141.36
Adobe Illustrator V7.0 upg WIN95/NT CD	\$89.96	Microsoft Visual Basic Pro V4.0 WIN95/NT CD	\$439.47
Adobe Illustrator V7.0 WIN95/NT CD	\$365.82	Microsoft Visual Basic Pro V5.0 comp upg	\$219.28
Adobe PageMaker V8.5 WIN95/NT CD	\$846.78	Microsoft Visual Basic Pro V5.0 WIN95/NT	\$439.47
Adobe PageMaker V8.5 WIN95/NT upg	\$89.96	Microsoft Visual C++ Pro V5.0 upg WIN95/NT	\$121.17
Adobe PageMaker V2.0 WIN95 3.5 CD	\$90.07	Microsoft Visual C++ Pro V5.0 WIN95/NT	\$439.47
Adobe Photoshop 4.0 WIN95/NT CD	\$445.76	Microsoft Visual FoxPro V5.0 Pro WIN95/NT	\$178.47
Adobe Photoshop V4.0 WIN95/NT upg CD	\$129.80	Microsoft Windows 95 WinInternet Explorer upg CD	\$90.11
Adobe Type Manager Deluxe V4.0 WIN95 CD	\$62.44	Microsoft Windows NT Workstation V4.0 CD	\$269.94
Autodesk Paradox V7.0 WIN95 upg CD	\$80.73	Microsoft Windows NT Workstation V4.0 upg CD	\$229.38
Caere OmniForm V2.0 WIN95	\$129.26	Microsoft Windows 97 WIN95/NT CD	\$298.91
Caere OmniForm V2.0 WIN95 upg	\$109.09	Microsoft Windows 97 WIN95/NT upg CD	\$75.25
Caere OmniPage Pro V3.0 WIN95/NT upg	\$175.48	MS Windows NT Workstation V4.0 vers upg CD	\$129.52
Caere OmniPage Pro V3.0 WIN95/NT upg	\$80.01	NetManage ECCO Pro V4.0 WIN95 CD	\$68.83
Corel Office Pro V7.0 WIN95	\$276.61	Quick QuarkPress V3.32 WIN95/NT	\$595.81
Corel Office Pro V7.0 WIN95 compers upg	\$187.14	Quartermaster Clean Sweep V3.0 WIN95/NT	\$36.01
Corel Office Pro V7.0 WIN95 upg CD	\$187.14	Quartermaster Procomm Plus V4.0 WIN95 CD	\$119.17
Corel WordPerfect Suite V7.0 WIN95 upg CD	\$91.32	Star Race-Out V7.0 host/runner 3.5	\$119.72
CorelDRAW V7 WIN95/NT CD	\$434.99	Symantec ACT! V3.0 WIN95/NT	\$109.10
CorelDRAW V7 WIN95/NT upg CD	\$225.51	Symantec ACT! V3.0 WIN95/NT upg CD	\$81.73
Goldmine V3.2 WIN95	\$184.91	Symantec Norton AntiVirus V2.0 WIN95	\$63.83
Intuit QuickBooks V5.0 WIN95	\$94.57	Symantec Norton Utilities V2.0 WIN95 CD	\$48.08
Lotus Organizer 97 WIN95 CD	\$71.35	Symantec Norton Utilities V2.0 WIN95 upg	\$67.36
Lotus Organizer 97 WIN95/NT 3.5	\$89.25	Symantec pcANYWHERE V7.5 WIN95/NT	\$79.06
Lotus SmartSuite 97 WIN95/NT CD	\$139.37	Symantec pcANYWHERE V7.5 WIN95/NT	\$119.80
Lotus SmartSuite 97 WIN95/NT upg	\$376.70	Symantec WinFax Pro V8.0 WIN95/NT	\$90.81
Macromedia Director 6 Multimedia Studio WIN95/NT CD	\$620.20	Traveling Software Laplink V7.5 WIN95	\$129.47
Macromedia Director 6 upg WIN95/NT CD	\$373.88	Visual Technician V4.5 WIN95/NT CD	\$386.33
Macromedia Visual Scan V3.0 WIN95/NT/DOS/OS2	\$40.37	Visual V4.0 WIN95 3.5 CD	\$129.50
Metabolt's Key Photo Soap WIN95/NT CD	\$43.65	Xerox Page PRO97 WIN95/NT CD	\$14.62
Microsoft Access 97 WIN95/NT CD	\$266.01		
Microsoft Access 97 WIN95/NT upg CD	\$94.05		
Microsoft AutoSnap Streets Plus 1997 Deluxe CD	\$35.77		
Microsoft Encarta 97 Encyclopedia Deluxe	\$67.24		
Microsoft Excel 97 WIN95/NT CD	\$94.05		
Microsoft Excel 97 WIN95/NT upg CD	\$94.05		
Microsoft FrontPage 97 w/Bonus Pack WIN95/NT CD	\$134.84		
Microsoft FrontPage 97 w/Bonus Pack WIN95/NT upg CD	\$48.08		
Microsoft Games Sampler 2 WIN95 CD	\$9.95		
Microsoft Money 97 WIN95 CD	\$39.42		
Microsoft Office 97 Pro Upg w/Built-in Internetmouse CD	\$131.00		
Microsoft Office 97 Pro w/Built-in WIN95 CD upg	\$209.99		
Microsoft Office 97 Pro w/Built-in WIN95/NT CD	\$629.97		
Microsoft Office 97 Std WIN95/NT CD	\$438.26		
Microsoft Office 97 Std WIN95/NT upg CD	\$209.90		
Microsoft Plus! WIN95 CD	\$45.48		
Microsoft Project V4.1 WIN95	\$416.71		
Microsoft Project V4.1 WIN95 CD	\$417.46		

800-294-4239

CDW's Volume Software Licensing Department



Novell IntranetWare



For Small Business

- 32MHz
- 32-bit MIPS R3000 processor
- Netcape Navigator V3.0 provides access to the Internet
- NetWare Connect™ allows users to

access their network anytime, anywhere

■ NDS™ provides a single view of all network resources

Server with 5 licenses

\$594.80 CDW 82017

1-user additional license

\$46.64 CDW 82020

5-user additional license

\$216.83 CDW 82022

Call CDW for upgrades and multi-user licenses!

COREL WordPerfect Suite 8 For Windows 95 and NT

Updated applications offer a new level of responsiveness and performance while advanced Internet tools make publishing and presenting on the web a seamless process. A streamlined, intuitive interface, state-of-the-art scheduling and calendaring and an advanced help system power you through your workday—making even the most complicated task easy.

Upgrade CD

\$114.36* CDW 87888

CD

\$277.99 CDW 87887

*After \$20 mail-in manufacturer rebate.

Offer ends 6/1/98.

OKIDATA® Price Drop!

Okipage 16n

- 600 x 600 dpi with OKI Smoothing Technology
- 16 ppm print speed ■ 32MHz 32-bit MIPS

\$859.10 CDW 79645

OKI LAN Ethernet Token Ring network interface card

\$388.03 CDW 72847

OKI LAN Token Ring network interface card

\$499.61 CDW 84211

Okipage 16n toner cartridge

\$41.42 CDW 55812

NEW!

R3000 processor ■ 2MB RAM standard, expandable to 66MB

■ 35 scalable PCL and 10 scalable TrueType fonts ■ Optional network interface cards

\$174.51* CDW 72264

MICROTEK SCANMAKER E3

\$174.51* CDW 72264

CDW

CDW

CDW

CDW

CDW

CDW

CDW

CDW

CDW

CDW

CDW

CDW

CDW

CDW

CDW offers \$2.99 shipping on all orders \$200 or less!

800-326-4239

CDW

©1997 CDW Computer Center, Inc.

200 N. Milwaukee Avenue, Schaumburg, IL 60196

1-800-326-4239



**COMPUTER
DISCOUNT
WAREHOUSE**

**The right price.
The right advice.**

**Complete
and**

COMPAQ

Deskpro 2000 Series

Affordable, manageable desktop PCs for business environments

- Intel Pentium® processors with MMX technology
- 256KB Level 2 cache
- 16MB or 32MB SDRAM standard
- 2.1GB or 3.2GB S.M.A.R.T. EIDE hard drives
- CDS models include internal 16X Max EIDE CD-ROM drive and Enhanced Business Pro Audio
- Integrated S3/V2 enhanced 64-bit graphics
- 1MB SGRAM standard, expandable to 2MB
- Expansion slots: two PCI; one shared PCI/ISA; two ISA
- Ports: serial; ECP parallel; two USB; keyboard; mouse; video
- Microsoft Windows® 95
- Intelligent Manageability
- 3-year parts, 1-year labor and on-site repair warranty

**NEW
models!**



Monitor sold separately

Compaq Deskpro 2000 series

Desktop	CPU	RAM	Hard drive	CD-ROM	Price	CDW
5166X/2100	166MHz Pentium MMX	16MB	2.1GB	-	\$1199.00	92269
5166X/3200	166MHz Pentium MMX	16MB	3.2GB	-	\$1309.00	92838
5200X/2100	200MHz Pentium MMX	16MB	2.1GB	-	\$1389.00	92840
5200X/3200	200MHz Pentium MMX	32MB	3.2GB	-	\$1579.00	92841
5233X/3200/CDS	233MHz Pentium MMX	32MB	3.2GB	16X Max	\$1949.00	92843
Mini-tower						
Desktop	CPU	RAM	Hard drive	CD-ROM	Price	CDW
5166X/3200CDS	166MHz Pentium MMX	32MB	3.2GB	16X Max	\$1619.00	92839
5200X/3200/CDS	200MHz Pentium MMX	32MB	3.2GB	16X Max	\$1769.00	92842

Deskpro 4000 Series

Network-ready, optimal performance

- Intel Pentium® processors with MMX technology and Pentium II processors
- 512KB Level 2 cache
- 16MB or 32MB SDRAM standard
- 2.4GB or 3.2GB S.M.A.R.T. Ultra ATA hard drives
- CDS models include internal 16X Max EIDE CD-ROM drive and Enhanced Business Pro Audio
- Integrated S3Virge/GX enhanced 64-bit graphics controller with 3D acceleration
- 2MB SGRAM standard
- Expansion slots: two PCI; one shared PCI/ISA; two ISA (MMX models), three PCI; one ISA; one PCI/ISA (Pentium II model)
- Expansion slots (mini-towers): four PCI; three ISA
- Ports: 2 serial; ECP parallel; 2 USB; keyboard; mouse; video; RJ-45; infrared; audio input/output (CDS models only)
- Integrated Netelligent 10/100 TX Ethernet controller
- Microsoft Windows® 95 or Windows NT Workstation V4.0 (Pentium II models)
- Included software: Insight Personal Edition; Enhanced Intelligent Manageability; Diagnostics for Windows Utility
- 3-year parts, 1-year labor and on-site repair warranty

Compaq Deskpro 4000 series

Desktop	CPU	RAM	Hard drive	CD-ROM	Price	CDW
5166X/2400	166MHz Pentium MMX	16MB	2.4GB	-	\$1389.00	92844
5166X/3200	166MHz Pentium MMX	32MB	3.2GB	-	\$1599.00	92845
5200X/2400	200MHz Pentium MMX	32MB	2.4GB	-	\$1689.00	92847
5200X/3200	200MHz Pentium MMX	32MB	3.2GB	-	\$1759.00	92848
5233X/3200X/CDS	233MHz Pentium MMX	32MB	3.2GB	16X Max	\$2129.00	92849
6233X/2500/CDS	233MHz Pentium II	32MB	2.5GB	16X Max	\$2319.00	88475
Mini-tower						
Desktop	CPU	RAM	Hard drive	CD-ROM	Price	CDW
5166X/3200/CDS	166MHz Pentium MMX	32MB	3.2GB	16X Max	\$1799.00	92846

**NEW
models!**



Monitor sold separately

Deskpro 6000 Series

Performance and networking for power computing environments

- Intel Pentium II and Pentium Pro processors
- 512KB Level 2 cache (Pentium II); 256KB L2 cache (Pentium Pro)
- 32MB or 64MB EDO RAM standard
- 2.15GB or 4.2GB Ultra SCSI hard drives
- PDS models include: internal SCSI PD-CD drive; Enhanced Business Pro Audio
- CDS models include: internal 8X IDE CD-ROM drive; Enhanced Business Pro Audio; Windows Sound System V2.0
- Matrox Millennium graphics controller
- 2MB WRAM standard
- Expansion slots: three PCI; one shared PCI/ISA; one ISA
- Expansion slots (mini-towers): four PCI; three ISA
- Ports: two serial; ECP parallel; keyboard; mouse; video; RJ-45; infrared; audio input/output (CDS, PDS models only)
- Integrated 10BASE-T Ethernet controller; upgradeable with optional 100BASE-TX UTP Module
- Operating system: Microsoft Windows NT Workstation V4.0 CD-ROM
- Included software: Insight Personal Edition; Enhanced Intelligent Manageability; Diagnostics for Windows Utility
- 3-year parts, 1-year labor and on-site repair warranty

Compaq Deskpro 6000 series

Desktop	CPU	RAM	Hard drive	CD-ROM	Price	CDW
6200/2150/CDS	200MHz Pentium Pro	32MB	2.15GB	8X	\$2459.00	72786
6200/4200/PDS	200MHz Pentium Pro	32MB	4.2GB	PD-CD Drive	\$2789.00	84268
6233X/2150/PDS	233MHz Pentium II	32MB	2.15GB	PD-CD Drive	\$2629.00	88473
6266X/4200/CDS	266MHz Pentium II	32MB	4.2GB	8X	\$3179.00	88474
Mini-tower						
Desktop	CPU	RAM	Hard drive	CD-ROM	Price	CDW
6200/4200/PDS	200MHz Pentium Pro	64MB	4.2GB	PD-CD Drive	\$3099.00	84271

800-326-4239

www.cdw.com/pc

©1997 CDW Computer Catalog, Inc.
290 N. Milwaukee Avenue, Vernon Hills, IL 60061
E-Mail: sales@cdw.com

CDW offers FREE configuration of your new PC purchase!

COMPUTER DISCOUNT WAREHOUSE

value-priced computing solutions!



HP Vectra VL PC Series 5

Advanced manageability

HP Vectra VL PC Series 5 combines value pricing with advanced performance and upgradeability, along with a host of features tailored to suit all the office needs of your business.

Monitor sold separately

HP Vectra VL PC Series 5

Desktop CPU	RAM	Hard drive	CD-ROM	Price	CDW
166MHz Pentium	16MB	1.6GB	—	\$1166.30	85717
166MHz Pentium MMX	16MB	2.5GB	8X	\$1171.09	91115
200MHz Pentium	32MB	2.5GB	8X	\$1449.60	89511
200MHz Pentium MMX	32MB	2.5GB	8X	\$1599.12	91119
233MHz Pentium MMX	16MB	2.5GB	—	\$1599.12	91120
Mini-tower CPU	RAM	Hard drive	CD-ROM	Price	CDW
133MHz Pentium	16MB	1.6GB	—	\$1219.44	86523
166MHz Pentium	16MB	2.5GB	—	\$1229.30	86527
166MHz Pentium MMX	16MB	2.5GB	8X	\$1439.22	91121
166MHz Pentium	32MB	2.5GB	8X	\$1519.54	86421
200MHz Pentium	16MB	2.5GB	8X	\$1595.29	84733
233MHz Pentium MMX	32MB	4GB	—	\$1889.76	91123

TOSHIBA

Equium Series PCs

A complete personal computing solution



Monitor sold separately

The Toshiba Equium series is designed to lower the total cost of PC ownership while providing stability of components, reliability and a rich feature set of relevant technology. All systems feature Intel Pentium processors, integrated 10/100 Ethernet networking, Universal Serial Bus, 12X CD-ROM, 3D video,

a Windows® 95 keyboard and a three-button mouse. All systems are DMI 2.0 compliant and include Intel's LANdesk Client Manager software. It's everything you need in a personal computing solution and more.

Toshiba Equium systems

Desktop	CPU	RAM	Hard drive	CD-ROM	Price	CDW
5160D	166MHz Pentium MMX	32MB	2.07GB	12X	\$1649.47	84248
5200D	200MHz Pentium MMX	32MB	2.38GB	12X	\$1847.45	84249
6200D	200MHz Pentium Pro	32MB	2.95GB	12X	\$2234.52	84251
Mini-tower	CPU	RAM	Hard drive	CD-ROM	Price	CDW
6200M	200MHz Pentium Pro	32MB	4.24GB	12X	\$3099.92	84252
6260M	266MHz Pentium II	32MB	3.73GB	16X	\$2698.61	93106



IBM PC 300GL Series

A perfect combination of price and performance

IBM PC 300GL Series computers offer Intel® Pentium® processors, large capacity 1.2GB or 2.5GB hard drives, fast 64-bit PCI graphics and Windows 95 or Windows NT Workstation V4.0 on select models.

■ Intel Pentium or Pentium MMX processors ■ 256KB pipeline burst Level 2 cache ■ SDRAM memory ■ Expansion slots: one PCI, one ISA, two shared PCI/ISA ■ Four bays (two available) ■ Two USB ports ■ 1-year, on-site limited warranty (3 years parts)

IBM PC 300GL Series

CPU	RAM	Hard drive	CD-ROM	Price	CDW
166MHz Pentium	16MB	1.2GB	—	\$999.63	85188
166MHz Pentium	16MB	2.5GB	—	\$1129.68	85190
166MHz Pentium	16MB	2.5GB	16X	\$1369.68	85189
166MHz Pentium MMX*	32MB	2.5GB	—	\$1426.68	85405

*Includes Windows NT Workstation V4.0

IBM PC 300XL Series

IBM PC 300XL Series computers take advantage of the new Intel Pentium® II processor with MMX technology for unparalleled system performance. The PC 300XL Series incorporates the latest technology including infrared, Universal Serial Bus (USB), SMART EIDE hard drives, 10/100 Ethernet and 16X Max (variable speed) CD-ROM drives. All IBM PC 300XLs ship with either Microsoft NT Workstation V4.0 or Windows 95, Lotus SmartSuite license, TME-10 NetFinity, Intel LANdesk for Windows NT and more!

■ Intel Pentium II MMX processor ■ 512KB Level 2 cache ■ S3 Trio V2 graphics with 2MB EDO video memory ■ Five expansion slots and five bays ■ Two USB ports ■ 1-year limited warranty (3 years parts)

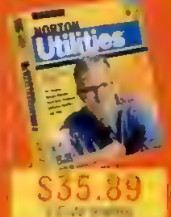
IBM PC 300XL Series

CPU	RAM	Hard drive	CD-ROM	Price	CDW
233MHz Pentium II	32MB	2.5GB	16X Max	\$2296.80	86313
233MHz Pentium II*	32MB	2.5GB	—	\$1999.36	86314
266MHz Pentium II	32MB	4.2GB	16X Max	\$2659.12	86315
266MHz Pentium II	32MB	4.3GB**	16X Max	\$2997.69	86316

*Includes Windows 95 **Wide Ultra SCSI

Check out this special purchase!

Buy any computer and pick up Symantec Norton Utilities or Norton Utilities Plus for only \$34.32 or \$35.89.



4-year Quality Express Service plan only \$269.
Call CDW® for details!

800-326-4239

www.cdw.com





**COMPUTER
DISCOUNT
WAREHOUSE**

The right price.
The right advice.

Nobody knows

IBM

Business
Partner

New!

IBM PC Server 315

IBM PC Server 315 is a powerful entry-business, mini-tower network server. It combines Pentium® Pro performance and substantial data storage capacity with ease of installation and system management. This combination of features provides a very affordable package designed to appeal to small business owners.

- Intel Pentium® Pro processors
- Includes 256KB write-back Level 2 cache ■ 32MB ECC RAM standard expandable to 512MB
- PCI SVGA video with 1MB video memory ■ Internal expansion slots 1 shared PCI/ISA; 4 PCI, 2 ISA ■ Six expansion bays three or four available (depending on configuration) ■ Includes: PCI Wide Ultra SCSI hard drive controller ■ 3-year warranty



IBM PC Server 315

CPU	RAM	Hard drive	CD-ROM	Ethernet	Price	CDW
200MHz Pentium Pro	32MB	—	8X	—	\$2399.63	89310
200MHz Pentium Pro	32MB	2.1GB	8X	10/100Mbps	\$2799.96	89311

Novell
Everything's Connected



IntranetWare

**IntranetWare is
NetWare V4.11 and more!**

- Enables you to use your IntranetWare server as a web server ■ Includes File Transfer Protocol (FTP) services ■ Provides multiprotocol routing, including IPX/SPX, TCP/IP and AppleTalk
- Provides an IP/IPX gateway ■ Enables you to integrate your IP and IPX networks ■ Enables you to manage NetWare 3, NetWare 4, and IntranetWare servers using a single utility

5-user, CD.....	\$654.39	CDW 75733
10-user, CD.....	\$1316.20	CDW 75736
25-user, CD.....	\$2309.55	CDW 75737
50-user, CD.....	\$3119.90	CDW 75738



IntranetWare For Small Business

The right size, the right price

- Simple installation ■ Add connections to the network one at a time ■ Netscape Navigator V3.0 provides access to the Internet ■ NetWare Connect™ allows users to access their network anytime, anywhere ■ NDS™ provides a single view of all network resources

Server with 5 licenses.....	\$594.80	CDW 82017
1-user additional license.....	\$46.64	CDW 82020
5-user additional license.....	\$216.83	CDW 82022
Upgrade, 5-user.....	\$329.93	CDW 82024
Upgrade, 10-user.....	\$528.87	CDW 82025

3Com

OfficeConnect

**Compact, easy-to-use
products that simplify
small-office networking**



This Ethernet-based product family provides a range of affordable, stackable units that combine simplicity of design and operation with advanced functionality and outstanding speed. As a result, everyone in your small office can take full advantage of the virtually instant information access made possible by e-mail, groupware and other powerful networked applications, not to mention Internet access.

Hub/TP4 4 RJ-45 ports.....	\$72.91	CDW 82295
Hub/TP4 combo 4 RJ-45 ports, AUI and BNC.....	\$99.33	CDW 82298
Hub/TP08 8 RJ-45 ports.....	\$119.76	CDW 86411
Hub/TPC8 8 RJ-45 ports, 1 BNC port.....	\$149.78	CDW 86409
Hub/TPM8 8 RJ-45 ports, SNMP management.....	\$377.29	CDW 86410
Hub/TP16C 16 RJ-45 ports, AUI.....	\$249.87	CDW 82299
Hub/STP100 Fast Ethernet hub.....	\$659.82	CDW 75414
Switch 140 Fast Ethernet to Ethernet switch.....	\$689.64	CDW 76715
Remote 530 ISDN router.....	\$1008.99	CDW 83400

LINKSYS

EtherFast 4-Port 100BASE-TX Stackable Hub

Compact and expandable

New!

The new 4-port 100BASE-TX stackable hub is the ideal solution for a cost effective move into Fast Ethernet. With built-in expandability, you can add more ports as business demands. Stack up to two hubs high with the included stacking cable. Uplink port provides access to other hubs or switches.



\$184.35 CDW 81908

EtherFast 8-Port 100BASE-TX Hub.....	\$359.50	CDW 75596
■ Eight 100BASE-TX ports; uplinkable		
EtherFast 10/100BASE-TX LAN Card.....	\$58.10	CDW 82822
■ PCI, full-duplex, 10/100 auto-sensing port		

EtherFast 2-Port 10/100 Switch

Smooth migration from 10BASE-T to 100BASE-TX

Two auto-sensing 10/100 ports allow easy integration of 10BASE-T and 100BASE-TX. Simply attach your 10BASE-T hub(s) to port one, then your 100BASE-TX hub(s) to port two. Full duplex capable.



\$269.32 CDW 90051

10BASE-T hubs

Network Starter Kit 5-port hub, 2 PCI NICs, cabling.....	\$109.13	CDW 83590
5-port 5 10BASE-T ports, uplinkable.....	\$49.53	CDW 57807
10-port 9 10BASE-T ports + BNC, uplinkable.....	\$89.29	CDW 70377
20-port 20 10BASE-T ports + BNC, uplinkable.....	\$165.40	CDW 75530
16-port 16 10BASE-T ports + BNC, AUI, rackmount.....	\$207.23	CDW 54746

800-326-4239

CDW offers Airborne Express next day delivery for as low as \$9.75!

COMPUTER DISCOUNT WAREHOUSE

networking like CDW!

Seagate Software

Seagate Backup Exec V6.11 For Windows NT



Seagate Backup Exec™ for Windows NT is the industry standard, 100% compatible backup solution for the complete Windows NT environment—including BackOffice. With unmatched performance, centralized administration and ExecView monitoring, Backup Exec's 32-bit design provides an easy to use, reliable backup solution for total data protection. System Services support allows backups to occur without users logging on while Remote Access Services (RAS) guarantees efficient management of remote servers. Backup Exec is 100% Microsoft Tape Format (MTF) compatible, providing complete interchange with the Windows NT backup utility. Software data compression maximizes storage capacity while protecting the entire enterprise network.

Single Server Edition **\$414.90** CDW 73810
Enterprise Edition **\$817.06** CDW 73809



Seagate Backup Exec V7.11 For NetWare

Special introductory price!
Seagate Intelligent Disaster Recovery Option for NetWare®
\$259.48 CDW 91297

Offer ends 9/30/97 while supplies last.

Seagate Backup Exec™ for NetWare is one of the safest, most reliable solutions available today. With Storage Management Services (SMS) support, Backup Exec protects NetWare 3 and 4 servers, as well as future generations of NetWare. Backup Exec also ensures full data recovery by protecting all of your network data including objects, containers and scheme extensions.

Single Server, 25-user edition **\$308.05** CDW 77196
Single Server, unlimited edition **\$419.26** CDW 73141
Enterprise edition **\$877.92** CDW 76531
Backup Exec V2.0 for Windows 95 **\$61.64** CDW 82406

* With full Novell Storage Management Services compliance, there's no need for CD-ROMs or knowledge of NetWare. IFS® backup or NDS® Seagate Intelligent Disaster Recovery for NetWare. Offers fast, reliable and easy to use disaster recovery for every server protected by Seagate Backup Exec.



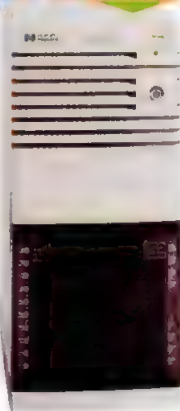
New!

HP NetServer E40

The server your business can depend on

Designed to meet the unique needs of self-supported workgroups, the HP NetServer E40 delivers true server performance and superior dependability at the price of a desktop PC. A multipurpose server optimized for connecting 25 nodes or less, the HP NetServer E40 enables improved productivity and efficiency, with ease and dependability built in at every level.

- Intel Pentium® Pro processors
- 256KB write-back Level 2 cache
- PCI Fast SCSI-2 hard drive controller
- Internal expansion slots: two PCI, two ISA, two shared PCI/ISA
- Six expansion bays (four available)
- Novell IntranetWare for Small Business
- 1-year onsite warranty



HP NetServer E40

CPU	RAM	Hard drive	CD-ROM	Ethernet	Price	CDW
5/180	16MB	—	8X	10/100Mbps	\$2054.28	91381
6/180	16MB	2.1GB	8X	10/100Mbps	\$2314.03	91478
6/200	32MB	—	8X	10/100Mbps	\$2394.91	91479
6/200	32MB	2.1GB	8X	10/100Mbps	\$2689.39	91480

HP JetDirect 10/100BASE-T internal print server card

New!



\$389.61 CDW 88077

The HP JetDirect Card for 10/100BASE-T provides an easy, affordable migration path from 10BASE-T to high-speed network printing. Part of HP's complete network printing solution, it delivers high-performance, high-quality connectivity at either 10Mbps or 100Mbps. Ideal for both 10BASE-T and 100BASE-TX networks.

HP JetDirect 150X external print server

New!

The HP JetDirect 150X external print server has been tailor-designed for the smaller business network environment. The 150X supports both Novell NetWare and Windows NT server environments. It includes a quick installation guide and simple software, making set up a snap. With HP trusted reliability, free technical support, total printer location flexibility and industry leading performance, the JetDirect 150X is the best way for smaller businesses to share their printers.

\$169.46 CDW 88074



Check out these HOT BUYS!!



Linksys Ethernet 5-Port Workgroup Hub

\$44.43*
CDW 57807



APC BACKUPS 280

\$87.88*
CDW 44559

CDW is your "Best Place to Buy" networking!

800-326-4239





**COMPUTER
DISCOUNT
WAREHOUSE**

The right price.
The right advice.

We offer you

“Get more than
just a great price.
Call today and get a
little empathy,
some free advice
and a free CDW
catalog.”



Director 6 Multimedia Studio

New Director 6 Multimedia Studio gives you the most advanced web authoring and playback capabilities available. Create Internet and hybrid CD-Internet applications with new drag-and-drop behaviors and live web authoring. With streaming Shockwave, there's no waiting for the entire file to download—even over small bandwidth connections!

Upgrade	\$478.48	CDW 84254
Full version	\$929.20	CDW 84250
Flash 2	\$184.59	CDW 85794
■ Easily create fast web multimedia ■ Use numerous interactive animations, buttons, sounds and graphics on every page of your site		

ViewSonic® G771



- 17" color monitor**
- 17" Super Contrast flat screen, 16" viewable image size
 - 0.27mm dot pitch
 - Maximum resolution: 1280 x 1024; 1024 x 768 at 87Hz
 - 3-year limited warranty

\$578.31 CDW 88861

CALL: CDW 88862

- EA771
- 17" CRT, 16" viewable image size
 - 0.27mm dot pitch
 - Maximum resolution: 1280 x 1024; 1024 x 768 at 87Hz
 - Built-in speakers

Hardware, Software & Peripherals at DISCOUNT Prices!

NETWORKING PRODUCTS

Microsoft	
Windows NT Server V4.0	
Upg + 5-client license CD	346.99
Upg + 10-client license CD	469.31
Comp upg + 5-client license CD	349.34
Comp upg + 10-client license CD	469.31
Server + 5-client license CD	605.98
Server + 10-client license CD	969.18
Single-client license upg.	15.48
Single-client license	29.96
Windows NT Workstation V4.0	
Version upg CD	129.52
Single-client upg.	229.39
Full version CD	269.94

Novell

IntranetWare	
5-user CD	654.39
10-user CD	1316.20
25-user CD	2309.55
50-user CD	3119.90
Call for Novell IntranetWare upgrades.	
IntranetWare for Small Business	
1-user additional license	46.64
5-user additional license	216.83
Server with 5 licenses	594.80
Call for additional Novell IntranetWare multi-user configurations.	

3COM

3ComCompact IQ ISDN modem external	309.56
3C900 EtherLink XL PCI 10BT	99.44
3C900 EtherLink XL PCI combo	119.99
3C905 Fast EtherLink XL PCI 10/100BT	95.99
SystemConnect 8-port hub	119.76
SuperStack II Hub 12-port 10BT	499.48
SuperStack II Hub 24-port 10BT	869.44
<CHEYENNE LOGO>	

ARCserve V6.1 for NetWare	
workgroup edition 25-user license	374.57
ARCserve V6.1 for NetWare	
enterprise edition unlimited-user license	1049.62
<CISCO LOGO>	

MicroWeb 100 server	799.40
Catalyst 1900 24-port 10BT 2-port 100BT	2895.38
Catalyst 1900 24-port 10BT	
1-port 100BT 1-port 100FX	3269.75

COMPAQ

Netelligent 10BT PCI controller	83.17
Netelligent 10/100BTX PCI controller	99.76

HEWLETT PACKARD

DeskDirect 10/100Mbps PCI	128.36
JetDirect Ethernet 10BT	309.53
JetDirect Express PRO Ethernet internal	296.67
JetDirect ExpressPlus printer, external	396.93

intel

EtherExpress PRO 100 PCI	81.46
EtherExpress PRO/10+ PCI combo	119.07
NetPortExpress PRO Ethernet internal	268.54
NetPortExpress PRO Ethernet external	367.15

LINKSYS

Combo Ether16 LAN card	35.53
Combo Ether32 LAN card	49.53
Combo PC/Ethernet card 10BT	91.93
EtherFast 4-port 100BT stackable hub	184.35
10BT 5-port workgroup hub	49.53

NETWORKING PRODUCTS

NETGEAR

10/100 Fast Ethernet PCI adapter	61.69
EN104 4-port 10BT slimline Ethernet hub	55.09
EN108 8-port 10BT slimline Ethernet hub	87.02
FE104 4-port 100BT Fast Ethernet hub	779.67
FE108 8-port 100BT Fast Ethernet hub	364.67

DATA STORAGE

ionega	
Zip drive 100MB parallel	149.95
Zip drive 100MB external SCSI	149.95
Zip drive 100MB internal SCSI	149.95
Ditto Easy 800MB Traven internal	99.95
Jaz drive 1GB external SCSI-2	299.95
Jaz drive 1GB external SCSI-2	399.95
Ditto drive 2GB internal	149.95
Ditto drive 2GB external	199.95
Ditto Dualt Card	59.95

ByQuant

EZFlyer 230MB external	199.00
Syljet 1 5GB SCSI internal	399.00
Syljet 1 5GB SCSI external	499.00

INPUT DEVICES

Adecco NU-Form keyboard/touchpad	58.09
Alps GlidePoint Wave keyboard/touchpad	66.69
Alps GlidePoint Windows 95 keyboard	83.94
Calscomp Drawing State II 12x12 wireless pen	66.65
Casio QV-300 digital camera	209.57
Connectix Color QuickCam V2.0	334.92
Epson PhotoPC 500 digital camera	499.00
Epson ActionScanning System II	269.42
Epson Expression 635 Exec scanner	799.00
Hewlett Packard ScanJet 5a	329.57
Hewlett Packard ScanJet 5p	378.68
Hewlett Packard ScanJet 4c	799.00
Intel Video Phone send/receive up to 48	158.60
Kodak DC50 Digital Science Camera	699.00
Logitech Cyberman II game controller	85.50
Logitech PageScan Color Pro	268.82
Microtek Color PageWiz compact scanner	149.39
Microtek ScanMaker E3 color flatbed	174.58
Microtek ScanMaker E8 color color flatbed	329.73
Microtek ScanMaker V300 color flatbed	219.11
Nikon AX-110 ScanTouch scanner	286.26
Nikon CoolPix 300 digital camera	659.24
Play Snappy video still capture	195.97
Polaroid 2000/40 digital camera	287.79
Ricoh RDC-2 digital camera	799.00
UMAX Astra 600S scanner	216.22
UMAX Astra 600S scanner	235.65
UMAX Astra 1200S scanner	326.04
w/PhotoDeluxe	
Visioneer PaperPort mx scanner	179.37
Visioneer PaperPort ix scanner	179.37
Visioneer PaperPort Strobe scanner	299.00

MONITORS

MAG Innovation 110V2 14" 0.28mm	209.18
MAG Innovation 510V2 15" 0.28mm	289.78
MAG Innovation 710V2 17" 0.28mm	495.76
Magnavox MB4010 14" 0.28mm	219.41
Magnavox MV5011 15" 0.28mm	277.56
Magnavox MB7000 17" 0.28mm	509.69
NEC XV15+ 15" 0.25mm	379.81
NEC XV17+ 17" 0.28mm	665.16
NEC P750 17" 0.28mm	866.26
NEC P1150 21" 0.28mm	1497.13
Princeton E050 15" 0.28mm	289.76
Princeton E070 17" 0.28mm	489.49
Princeton E090 19" 0.28mm	859.39
Sony Multiscan 100ex 15" PnP 0.25mm	326.39
Sony Multiscan 100af 15" PnP 0.25mm	369.61
Sony Multiscan 200af 17" PnP 0.25mm	775.63

MONITORS

Sony Multiscan 300af 20" PnP 0.30mm	1379.45
ViewSonic E641 14" 0.28mm	209.35
ViewSonic E655 15" 0.28mm	294.93
ViewSonic G771 17" 0.27mm	578.35
ViewSonic P815 21" 0.25mm	1539.04

PROCESSOR UPGRADES

Intel	
Pentium OverDrive Processors	
63MHz	139.96
83MHz	199.28
120/133MHz upg for 5/60, 5/66	189.28
125MHz upg for 5/75	259.37
Pentium OverDrive Processors	
w/MMX Technology	
125MHz upg for 75MHz	319.48
150MHz upg for 90MHz	319.48
165MHz upg for 100MHz	339.25

MODEMS

Hayes	
ACCURA 336 V.34 internal w/fax	119.54
ACCURA 336 V.34 external w/fax	137.60
OPTIMA 336 Business Modem internal	226.29
OPTIMA 336 Business Modem external	236.48
ACCURA 56K internal	147.01
ACCURA 56K external	199.97
ACCURA 56K speakerphone internal	179.40
ACCURA 56K speakerphone external	184.51
OPTIMA 56K internal	289.81
OPTIMA 56K external	289.06
ACCURA 56K	249.45

MOTOROLA	
ModemSURF 56K internal	139.42
ModemSURF 56K external	159.48
VoiceSURF 56K internal	169.76
VoiceSURF 56K external	176.72
BitSURF Pro EZ ISDN	267.02

Robotics	
Sportster Series	
Winmodem V.34 33.6 internal w/fax	105.36
V.34 33.6 internal w/fax	119.18
V.34 33.6 external w/fax	144.48
Voice V.34 33.6 internal w/fax	149.49
Voice V.34 33.6 external w/fax	175.24
56K x2 internal	177.99
56K x2 external	177.99
56K x2 Voice external	217.99
56K x2 Voice external	237.99
ISDN 128K terminal adapter	229.66

Courier Series	
V.34 33.6 internal w/fax	219.96
V.34 33.6 external w/fax	239.57
56K internal	235.36
56K external	269.81
56K external	269.02
i-modem ISDN V.34 fax/modem external	205.49
DataBurst ISDN U interface external	239.28
DataBurst ISDN S/T interface external	

ZOOM	
33.6 voice/SVD internal	98.23
33.6 voice/SVD internal	118.87
V.34 1 Plus 33.6 fax/modem internal	81.46
V.34 1 Plus 33.6 fax/modem external	98.39
56K internal	147.01
56K external	166.12

PC CARDS

3Com LAN PC Card combo	174.85
3Com 33.6 10BT LAN+modem	306.72
3Com 33.6 10BT LAN+modem combo	339.08
3Com 32-bit Fast EtherLink XL CardBus	158.08
Hayes ACCURA 56K	199.54
Hayes OPTIMA 56K	207.04

PERIPHERALS

Motorola Montana 33.6	179.06
Motorola Mariner 33.6	349.54
New Media PC Card joystick adapter	58.23
Simple 33.6 cellular	146.59
Simple 33.6 Communicator w/SimpleJack	149.20
Simple 56K Communicator	109.00
U.S. Robotics Ethernet adapter w/JACK	239.00
U.S. Robotics 33.6 cellular	229.95
U.S. Robotics 33.6 cellular w/JACK	219.00
U.S. Robotics 56K w/JACK	229.95
Xircor 33.6	189.55
Xircor 33.6 Ethernet 10BT	279.20
Xircor 33.6 Ethernet combo	316.91

Canon

BJ-30 monochrome	269.06
BJC-70	297.28
BJC-240	169.00
BJC-620	329.00
BJC-4200	199.00
BJC-4550	499.00

EPSON

FX870	289.45
LQ870	349.81
LQ2070	379.04
LX300	169.74
Stylus Color 400	199.00
Stylus Color 600	299.00
Stylus Color 800	449.00
Stylus Color 1520	799.00
Stylus Color 3000	1999.00
Stylus Photo	499.00

HEWLETT PACKARD	
HP DeskJet 672C color printer	199.00
HP DeskJet 694C color printer	299.00
HP DeskJet 820Cse color printer	299.00
HP DeskJet 1000Cse color printer	499.00
HP LaserJet 5se printer	1049.00
HP LaserJet 8Lse printer	199.00
HP LaserJet 8MP printer	779.00
HP LaserJet 6Pse printer	679.45
HP OfficeJet 570 multi-function	599.00

OKIDATA

ML320 Turbo	316.55
ML380 Turbo	335.66
ML590	445.48
Okpage 4w	199.00
Okpage 16w	559.10
OL500e	299.00
OL810e	587.73

UPS SYSTEM

APC	
Back-UPS Office	189.95
Back-UPS Pro 280 PNP	144.03
Back-UPS Pro 420 PNP	237.77
Back-UPS Pro 650 PNP	287.44
Smart-UPS 450NET	315.37
Smart-UPS 700NET	374.87
Smart-UPS 1000NET	516.82
Smart-UPS w/ 650	319.56
Smart-UPS w/ 1000	429.36
SurgeArrest Personal	16.25
SurgeArrest Professional	26.57
SurgeArrest Network	29.45

TECNET	
BC Internet 325 2 outlets RJ11	89.84
BC Personal 280 2 outlets	89.98
BC PRO 675 4 outlets LAN port	209.24
Super 7 7 outlets	15.29
IBAR 4 4 outlets	38.33

800-326-4239

CDW has more than 350 account managers to help you with your computing needs

©1997 CDW Computer Company, Inc.
2000 N. Milwaukee Avenue, Suite 200, Lincoln Park, IL 60467
FAX: 847-426-3239

COMPUTER DISCOUNT WAREHOUSE

a rare sales too it's called objectivity.



Back-UPS Pro Plug and Play



FREE software!

- Automatic Voltage Regulation for brownout and overvoltage correction
- Full-time surge and noise suppression
- Modem/10Base-T surge suppression
- User-replaceable, hot-swappable batteries
- Also supports Windows, Windows 95
- Free PowerChute Pro for Windows 95 software provides graceful, unattended shutdown of Windows 95-based workstations
- 2-year warranty

280PNP, 280VA output	\$144.03	CDW 69969
420PNP, 420VA output	\$237.77	CDW 58625
650PNP, 650VA output	\$287.44	CDW 58626

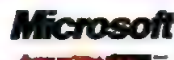
Windows NT Server V4.0

Windows NT reliability with the ease of use of Windows 95

- One platform for e-mail, file server, databases, and communications
- Integrates seamlessly with existing systems, including NetWare
- Built-in Internet, Intranet and communications services
- Includes web services, FrontPage and Internet Information Server
- Distributed on CD-ROM

Server + 5-clients	\$650.47	CDW 73221
Server + 10-clients	\$924.96	CDW 73222
Upg + 5 client licenses	\$284.43	CDW 73214
Upg + 10 client licenses	\$404.72	CDW 73216

* After \$75 CDW rebate valid for redemption on future CDW purchases. Offer ends 9/30/97.



IBM® ThinkPad® 380 Series

Exceptional combination of technological function and affordable price

- 150MHz Intel Pentium® processor
- 16MB EDO RAM standard, expandable to 80MB
- 1.08GB hard drive
- 12" 1" dual-scan SVGA color display
- Pre-loaded Windows® 95



As low as!

\$1739.89

CDW 86302

CDW® carries over 20,000 products! If you don't see it, Call!

COMPUTERS			COMPUTERS			COMPUTERS			COMPUTERS		
TOSHIBA			COMPAQ			IBM			NEC		
Libretto Mini-Notebooks			Armada Notebooks			PC300XL Series Desktops			Versa Notebooks		
50CT 5/75 16MB 722MB 6 1" active	1959.45		7710MT 5/150 MMX 16MB 1 GB	4399.00		233MHz Pentium II 32MB 2 GB	2599.89		2550 5/133 16MB 1 08GB 12 1" dual	1699.00	
Satellite 520CDS 5/133 16MB 1 34GB			7730MT 5/166 MMX 32MB 2 1GB			266MHz Pentium II 32MB 2 GB 18X CD	2997.63		2630CD 5/133 16MB 1.44GB	1999.00	
12 1" dual 10X CD	1959.45		12 1" active	4999.00		266MHz Pentium II 32MB 2 GB 18X CD	3379.75		12 1" active 10X CD	1999.00	
430COT 5/120 16MB 1 2GB			7750MT 5/166 MMX 32MB 2 1GB	5799.00		266MHz Pentium II 32MB 2 GB 18X CD			2650CD 5/150 MMX 16MB 1.44GB	2499.00	
11 3" active 10X CD	2279.16		12 1" active			266MHz Pentium II 32MB 2 GB 18X CD			12 1" dual 10X CD	2499.00	
440CDX 5/133 MMX 16MB			Desktop 4000 Desktops			266MHz Pentium II 32MB 2 GB 18X CD			2650COT 5/150 MMX 16MB 1.44GB	3199.00	
1.34GB 12 1" dual 10X CD	2449.73		5133/1200 5/133 16MB 1 2GB	989.00		266MHz Pentium II 32MB 2 GB 18X CD			6050MH 5/150 MMX 16MB 1.44GB	3799.00	
440COT 5/133 MMX 16MB 1 34GB			5133/2500 5/133 16MB 2 5GB	1089.00		266MHz Pentium II 32MB 2 GB 18X CD			12 1" active 10X CD	4399.00	
12 1" active 10X CD	3329.18		6180/1200CD 6/180 16MB 1 2GB 8X CD	1669.00		266MHz Pentium II 32MB 2 GB 18X CD			6050NT 5/150 MMX 16MB 2 1GB	4599.00	
440COT 5/166 MMX 32MB 2 02GB			6180/2500CD 6/180 32MB 2 5GB 8X CD	1559.00		266MHz Pentium II 32MB 2 GB 18X CD			6200MX 5/166 MMX 32MB 2 1GB	5699.00	
12 1" active 10X CD	4199.22		6200/2500CD 6/200 16MB 2 5GB 8X CD	1999.00		266MHz Pentium II 32MB 2 GB 18X CD			6200NT 5/166 MMX 32MB 2 1GB	5699.00	
Portege Notebooks			Desktoppro 2000 Mini-towers			266MHz Pentium II 32MB 2 GB 18X CD			13 3" active 10X CD	5699.00	
300CT 5/133 MMX 32MB 1.51GB			5133/2500CD 5/133 16MB 2 5GB 8X CD	1199.00		266MHz Pentium II 32MB 2 GB 18X CD			PowerMate Entry Value Desktops		
10 4" active	3424.86		5166/2500CD 5/166 32MB 2 5GB 8X CD	1549.00		266MHz Pentium II 32MB 2 GB 18X CD			V133a 5/133 16MB 1 2GB	999.99	
660COT 5/150 16MB 1 2GB			6200/2500CD 6/200 32MB 2 5GB 8X CD	2109.00		266MHz Pentium II 32MB 2 GB 18X CD			V133b 5/133 16MB 2 5GB 8X CD	1352.00	
11 3" active 10X CD	4237.92		5133/1620 5/133 16MB 1 62GB	1199.00		266MHz Pentium II 32MB 2 GB 18X CD			V2133 5/133 16MB 2 5GB 8X CD	1058.00	
Tecra Notebooks			5166/1620 5/166 16MB 1 62GB	1249.00		266MHz Pentium II 32MB 2 GB 18X CD			V2133 5/133 16MB 2 5GB 8X CD	1175.00	
510COT 5/133 16MB 2 1GB			5166/2500LS 5/166 16MB 2 5GB	1289.00		266MHz Pentium II 32MB 2 GB 18X CD			PowerMate Performance Desktops		
12 1" active 10X CD	2896.90		6180/1620CDS 6/180 32MB	2039.00		266MHz Pentium II 32MB 2 GB 18X CD			P2160X 5/166 MMX 32MB 2 1GB	1940.00	
520COT 5/166 MMX 32MB 2 02GB	4589.86		6180/2500CDS 6/180 32MB			266MHz Pentium II 32MB 2 GB 18X CD			P2200M 5/200 MMX 32MB 3GB 12X CD	1975.00	
530COT 5/166 MMX 32MB 2 02GB			6180/2500CDS 6/180 32MB	1979.00		266MHz Pentium II 32MB 2 GB 18X CD			PowerMate Performance Mini-towers		
12 1" active XGA 10X CD	4975.70		6200/2500CDS 6/200 32MB	2149.00		266MHz Pentium II 32MB 2 GB 18X CD			P2200M 5/200 MMX 32MB 3GB 12X CD	1975.00	
730COT 5/150 MMX 16MB 2GB			2 5GB 8X CD			266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD	4549.84		6200/2500CDS 6/200 32MB	2319.00		266MHz Pentium II 32MB 2 GB 18X CD					
740COT 5/166 MMX 16MB 2GB			6200/2500CDS 6/200 32MB			266MHz Pentium II 32MB 2 GB 18X CD					
13 3" active 10X CD	5589.75		6200/2500CDS 6/200 32MB	2459.00		266MHz Pentium II 32MB 2 GB 18X CD					
740COT 5/166 MMX 16MB 3GB			4 2GB PD CD	2799.00		266MHz Pentium II 32MB 2 GB 18X CD					
13 3" active 10X CD	6159.56		6233X/2150/PDS 233MHz Pentium II	2627.00		266MHz Pentium II 32MB 2 GB 18X CD					
Infinita Mini-towers			32MB 2 15GB			266MHz Pentium II 32MB 2 GB 18X CD					
7161 5/166 MMX 32MB 2 38GB 12X CD	1649.89		6233X/2150/PDS 233MHz Pentium II	3179.00		266MHz Pentium II 32MB 2 GB 18X CD					
7201 5/200 MMX 32MB 3GB 12X CD	1989.24		32MB 4 2GB			266MHz Pentium II 32MB 2 GB 18X CD					
Equium Desktops			Desktoppro 6000 Mini-towers			266MHz Pentium II 32MB 2 GB 18X CD					
5180D 5/166 MMX 32MB 2 1GB 12X CD	1649.47		5166/2150CDS 5/166 32MB	1819.00		266MHz Pentium II 32MB 2 GB 18X CD					
5200D 5/200 MMX 32MB 2 5GB 12X CD	1847.45		2 15GB 8X CD			266MHz Pentium II 32MB 2 GB 18X CD					
6200D 6/200 32MB 3GB 12X CD	2234.52		5166/2150/PDS 5/166 MMX 32MB	1849.00		266MHz Pentium II 32MB 2 GB 18X CD					
Equium Mini-towers			2 1GB PD CD			266MHz Pentium II 32MB 2 GB 18X CD					
6200M 6/200 32MB 4 3GB 12X CD	3099.92		5200X/4200/PDS 5/200 MMX 32MB	2589.00		266MHz Pentium II 32MB 2 GB 18X CD					
AST			4 2GB PD CD	3099.00		266MHz Pentium II 32MB 2 GB 18X CD					
Ascendia Notebooks			6200/4200/PDS 6/200 64MB			266MHz Pentium II 32MB 2 GB 18X CD					
A80 Plus 5/150 16MB 1 44GB			Presario Desktops			266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD	2658.65		2120 5/150 24MB 2GB 8X CD	999.00		266MHz Pentium II 32MB 2 GB 18X CD					
A80 Plus 5/150 16MB 2 1GB			Presario Mini-towers			266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD	2979.63		4808 5/200 MMX 32MB 4 3GB 24X CD	1999.00		266MHz Pentium II 32MB 2 GB 18X CD					
A70 Plus 5/150 MMX 16MB 1.44GB	3075.78		4814 5/200 MMX 32MB 6 5GB 24X CD	2499.00		266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD			lomega Zip drive			266MHz Pentium II 32MB 2 GB 18X CD					
A70 Plus 5/150 MMX 16MB 2 1GB	3445.14					266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD						266MHz Pentium II 32MB 2 GB 18X CD					
P70 5/150 MMX 32MB 2 1GB	3899.84					266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD	4389.43					266MHz Pentium II 32MB 2 GB 18X CD					
P80 5/166 MMX 32MB 3GB						266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD						266MHz Pentium II 32MB 2 GB 18X CD					
Bravo LC 6233 Series Desktops						266MHz Pentium II 32MB 2 GB 18X CD					
233MHz Pentium II 32MB 2GB						266MHz Pentium II 32MB 2 GB 18X CD					
16X CD Win95	2279.51					266MHz Pentium II 32MB 2 GB 18X CD					
233MHz Pentium II 32MB 2GB						266MHz Pentium II 32MB 2 GB 18X CD					
16X CD WinNT	2369.76					266MHz Pentium II 32MB 2 GB 18X CD					
Bravo MS Series Desktops						266MHz Pentium II 32MB 2 GB 18X CD					
5/166 16MB 2GB	1398.76					266MHz Pentium II 32MB 2 GB 18X CD					
5/166 32MB 2GB 16X CD	1627.74					266MHz Pentium II 32MB 2 GB 18X CD					
5/166 32MB 3GB 16X CD						266MHz Pentium II 32MB 2 GB 18X CD					
5/166 MMX 32MB 3GB 16X CD	1715.56					266MHz Pentium II 32MB 2 GB 18X CD					
5/200 32MB 3GB 16X CD	1798.12					266MHz Pentium II 32MB 2 GB 18X CD					
Bravo MS-T Series Mini-towers						266MHz Pentium II 32MB 2 GB 18X CD					
5/166 32MB 3GB 16X CD	1658.56					266MHz Pentium II 32MB 2 GB 18X CD					
5/200 32MB 3GB 16X CD	1629.85					266MHz Pentium II 32MB 2 GB 18X CD					
5/200 MMX 32MB 3GB 16X CD	2139.08					266MHz Pentium II 32MB 2 GB 18X CD					
COMPAQ						266MHz Pentium II 32MB 2 GB 18X CD					
Armada Notebooks						266MHz Pentium II 32MB 2 GB 18X CD					
1130T 5/120 16MB 1 08GB 10 4" active	1180.00					266MHz Pentium II 32MB 2 GB 18X CD					
1510DM 5/120 16MB 1GB						266MHz Pentium II 32MB 2 GB 18X CD					
11 3" dual 10X CD	1799.30					266MHz Pentium II 32MB 2 GB 18X CD					
1520DM 5/133 16MB 1GB						266MHz Pentium II 32MB 2 GB 18X CD					
11 3" dual 10X CD	1979.47					266MHz Pentium II 32MB 2 GB 18X CD					
1530DM 5/133 MMX 16MB 1 4GB						266MHz Pentium II 32MB 2 GB 18X CD					
12 1" dual 10X CD	2899.00					266MHz Pentium II 32MB 2 GB 18X CD					
1550DMT 5/133 16MB 1 4GB						266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD	3199.00					266MHz Pentium II 32MB 2 GB 18X CD					
1560DMT 5/150 MMX 16MB 2 1GB						266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active 10X CD	3999.00					266MHz Pentium II 32MB 2 GB 18X CD					
4120 5/120 16MB 1 08GB 11 3" dual	1299.00					266MHz Pentium II 32MB 2 GB 18X CD					
4130T 5/133 16MB 1 08GB 11 8" active	2549.00					266MHz Pentium II 32MB 2 GB 18X CD					
4131T 5/133 16MB 1 4GB 12 1" active	2849.00					266MHz Pentium II 32MB 2 GB 18X CD					
4150 5/150 MMX 16MB 1 6GB 12 1" active	2999.00					266MHz Pentium II 32MB 2 GB 18X CD					
4160T 5/166 MMX 16MB 2GB						266MHz Pentium II 32MB 2 GB 18X CD					
12 1" active	3999.00					266MHz Pentium II 32MB 2 GB 18X CD					

CDW® DIRECTORY

PC sales	800-326-4239
Misc sales	800-391-4239
Corporate sales	800-280-4239
Corporate software sales	800-284-4239
Government and Education sales	800-815-4239

CDW® TELEPHONE HOURS

Sales	Monday-Friday 7 a.m.-5 p.m. CT
Tech Support for Customers	Saturday 9 a.m.-5 p.m. CT
	Monday-Friday 9 a.m.-5 p.m. CT
	Saturday 9 a.m.-5 p.m. CT

BUY WITH CONFIDENCE

CDW® IS A NABSAQ TRADED COMPANY

TICKER SYMBOL CDWC D A B rated A1 Duns 10-782-7852

Ask Our Advisors

HARDWARE

Torn Between Two Pointers

Is it possible to set up two mice in Windows 95? My system currently has a PS/2 mouse installed, and I have a controller that uses a serial port and acts as if it were a mouse. I need this setup to play some of the games I have. Can it be done? How would I set this up?

THOMAS R. JOZAITIS
via ZDNet

PC MAGAZINE: With Windows 3.x, you have to restart Windows every time you want to change the pointing device. One of the subtle changes in Windows 95 is that you're no longer limited to a single pointing device.

Setting up a second mouse is easy: Just plug it in and Windows 95 should be able to locate it automatically; then install its driver software and you'll be ready to go. (If the device has special drivers that are not part of the included driver set, you may have to run through the device's installation procedure.)

If Windows 95 doesn't seem to notice that you've added a second pointing device, try running the Add New Hardware applet from Control Panel. Let it try to detect the new hardware. If that fails, run it again and tell it what you've added.

This feature will appeal to users for applications other than game-playing. For example, you can have a mouse and a trackball installed on the same system. You might prefer the mouse for word processing tasks but switch to the trackball for more precision when using a graphics program.—*Alfred Poor*

OPERATING ENVIRONMENTS

Displaying Animated Cursor Icons in Explorer

I use Microsoft Windows 95 on two different computers. On one, when I open Explorer and go to the directory that contains animated cursors, I can see the icon of the cursor. On the other computer I see only the generic icon. How can I set up Explorer to show the icons?

HERB KOLBE
via the Internet

PC MAGAZINE: One of your systems has the .ANI extension correctly set up as a registered file extension, and the other does not. On the system that does not display the .ANI icons, launch Explorer, select View | Options, and

REGEDIT4

```
[HKEY_CLASSES_ROOT\anifile]
```

```
@="Animated Cursor"
```

```
[HKEY_CLASSES_ROOT\anifile\DefaultIcon]
```

```
@="*1"
```

FIGURE 1: Launch this file to complete the process of registering the .ANI file type.

click the File Types tab. Then press the New button, enter "ANIfile" for the description of the type, and enter ".ANI" for the extension. Now press OK twice.

You don't have your icons next to the filenames yet, though. There's one more step. Create a file called Anicur.reg—copy it exactly from Figure 1. Now launch Anicur.reg from within Explorer, or enter Start Anicur.reg at the DOS prompt. If Explorer is running, restart it. Now the icon displayed next to each .ANI file correctly represents the animated cursor contained in that file.—*Neil J. Rubenking*

WORD PROCESSING

Numbered Lists in Word

The automatic numbering feature in Microsoft Word 6.0 is a welcome convenience most of the time, but I've recently run into a problem with it. It turns out that when you automatically number an existing list, parts of some items in it can disappear. More precisely, for items that begin with numerals, Word seems to throw away the leading numbers and replace them with the list numbers.

Consider a list with four items:

```
ABC
123 First Number
DEF
456 Second Number
```

If you select this list, then click on the Numbering button in the toolbar, the result will be

```
1. ABC
2. First Number
3. DEF
4. Second Number
```

The problem also shows up if you use the Format | Bullets and Numbering menu command rather than the toolbar button. Once the numbers are gone, they seem gone for good. If

you click on the Bullets toolbar button after adding automatic numbering, the leading numbers won't come back. Is there a good workaround for this problem? And has Microsoft fixed it in later versions of Word?

ED DESAUTELS
Madison, Wisconsin

PC MAGAZINE: This has been fixed in Word 97, and there is a workaround in Word versions 6 and 7, but the problem

is even worse in some ways than Mr. Desautels suggests. Not only will Word throw away leading numerals in an item, but if the item consists solely of a number, Word will throw away the entire item, leaving a blank, numbered line. If the entry consists of two multicharacter numbers separated by a space (like 123 456789), Word will throw away the first number and keep the second.

It's also true that once the leading numbers are gone, you can't get them back by redefining the list as a bulleted list. But you can get them back with the Undo command—using the Edit | Undo menu choice, the Ctrl-Z shortcut, or the Undo toolbar button. If you

OUR ADVISORS

Alfred Poor is a contributing editor and the author of *The Underground Guide to Hardware*.

Brian Proffitt is a contributing editor of *Computing Today* and the author of *OS/2 Warp Survival Kit*.

Sal Ricciardi is a contributing editor and the author of the *Running Fox-Pro* series from Microsoft Press.

Neil J. Rubenking is technical editor and author of *Delphi Programming for Dummies*.

Luisa Simone is a contributing editor and the author of *Microsoft Publisher by Design*.

Graig Stinson is a contributing editor and the coauthor of *Running Windows 3.1 and Running Microsoft Excel*.

M. David Stone is a contributing editor and the coauthor of *Word for Windows Companion, Second Edition*.



HOW FAST DO THESE NOTEBOOKS AND DESKTOPS GO? IT DEPENDS ON HOW FAST YOU DIAL.



To request a fax of weekly specials, call 800 952-1325
and enter document number 10003.

Forget everything you know about factory outlets. Well, almost everything. That's because at Dell Factory Outlet, you won't find damaged computers at skimpy markdowns.

And you won't find out-of-date technology. What you will find at Dell Factory Outlet are the award-winning lines of Dell® computer systems, completely refurbished and tested to meet our high standard of quality. Like notebooks featuring cutting-edge multimedia capabilities. And desktop systems featuring 266MHz Pentium® II processors. But here's the really big news. You can get all of this at incredible savings across the board.

Values so big, we call them **GIGABUYS!**® Inventories are limited to quantities in stock, and change regularly. So call us today. Don't miss out on your **GIGABUYS!**

**REFURBISHED DELL
LATITUDE® NOTEBOOKS**
166MHz PENTIUM® PROCESSOR
WITH MMX™ TECHNOLOGY

STARTING AT

\$2999

Active Matrix Display

**REFURBISHED DELL
DIMENSION® XPS DESKTOPS**
266MHz PENTIUM® II PROCESSOR

STARTING AT

\$1749

Monitor Sold Separately

**REFURBISHED DELL
OPTIPLEX® DESKTOPS**
266MHz PENTIUM® PRO PROCESSOR

STARTING AT

\$1499

Monitor Sold Separately

get a
GIGABUY!

TO ORDER, CALL TOLL FREE

1-888-783-6974

M-F 9AM-8PM, SAT. 9AM-6PM CDT

**CALL FOR CURRENT AVAILABILITY AND PRICING.
QUANTITIES LIMITED TO INVENTORY IN STOCK.**

DELL®
FACTORY OUTLET



The Dell Factory Outlet sells only refurbished computers. For pricing on new Dell computers, call (800) 284-0008.

Available configurations may vary. For a copy of our limited warranties, please write to Dell Factory Outlet, 8801 Research Blvd., Austin, TX 78758, Attn: Warranties. See back of your invoice for additional warranty and return policy information. All sales FOB Austin. Sales receipts required for all returns/exchanges. Supplies limited to stock on hand. No rain checks. Prices and specifications subject to change without notice and valid in the U.S.A. only. All items are subject to Dell Factory Outlet's 14-Day Price Protection Policy. Dell, the Dell logo, Latitude, OptiPlex and Dell Dimension are registered trademarks, and "get a GIGABUY!" and GIGABUYS! are service marks of Dell Computer Corporation. Intel, the Intel Inside Logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Quantities limited. ©1997 Dell Computer Corporation. All rights reserved. Printed in the U.S.A. Reproduction in any manner whatsoever without the written permission of Dell Computer Corporation is strictly forbidden. Dell cannot be responsible for errors in typography or photography.

Any Price!

Order and Register to
WIN
A Brand New
Mercedes!
Call for details.

We Now Carry HP's Full Line of Business Laser Printers!



Easy-to-Use, Value-Packed Printing for Small Workgroups!
HP LaserJet 5L Xtra Printer

5L Xtra Printer
\$299.99
#98141

- 600dpi resolution
- 100 levels of grayscale
- 100 to 400ppm printing
- Speed: 20sec
- Patented instant-on-fuser
- Free Netscape Navigator 2.0 & Avery Label Pro 2.0
- Refurbished by HP

Order#	Product	Price
#95513	HP LaserJet 6Lse printer, 600dpi (8ppm)	'399"
#95592	HP LaserJet 6Pse printer, 600dpi (8ppm)	'799"
#93582	HP Color LaserJet 5se printer, 600dpi (12ppm)	'1,048"
#77088	HP LaserJet 5si printer, 600dpi (24ppm)	'2,448"
#79342	HP Color LaserJet 5 printer	'3,998"

FREE!

Carrying Case
w/Any Notebook Purchase!
ISA Combo Ethernet Adapter
w/Any Desktop Purchase!
Pay only \$9 for Shipping and Handling.
Ask for #98604



NEW! SuperDisk LS-120 Floppy Drive

Stores 120MB on a 3.5" Diskette!

LS-120 drive only compatible with desktop computers.

Arrive
#83753 120MB Diskette
'17" ea.

\$99.99
Price after \$50 mail-in rebate

#98238



Your #1 Source for Memory!

Give Your CPU a Performance Boost!



FREE Grounding Wrist Strap with any memory purchase!
Ask for #92518

4MB AS LOW AS \$24
#14460

8MB AS LOW AS \$39
#14177

16MB AS LOW AS \$59
#65416



Kingston

Call today for our latest memory pricing!

Exclusive Zip and Jaz Deals!

Zip 100MB Drive only
\$149.99
#70093



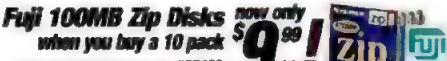
#97097 Zip Drive, Hot Dog 2.0 & WebCompass 2.0
'179"



Jaz Insider 1GB Drive only
\$299.99
w/Full Gravity Internet Newsreader Software
#98021

#98022 Jaz 1GB External w/Full Gravity Newsreader
'399"

Fuji 100MB Zip Disks now only
\$9.99 when you buy a 10 pack
Price after \$20 mail-in rebate. #87482



Fujitsu 2.1GB 2.1GB EIDE Hard Drive

EIDE
10MS Access Time
Easy installation

\$189.99
#91188

Order#	Manufacturer	Product	Price
#95262	Maxtor	Crystal Max/2 1GB/EIDE	'192"
#92116		Crystal Max/3 568/EIDE	'252"
#92183		Medalist 1276 1 2GB EIDE	'176"
#90693		Medalist 171 7GB/EIDE	'186"
#92137	Seagate	Medalist 2132/2 1GB/EIDE	'183"
#90624		Medalist Pro/2 568/EIDE	'215"
#88412	Quantum	Fireball 3 8GB/EIDE	'333"
#95044		Caviar AC33100/3 1GB/EIDE	'246"
#90696		Caviar AC22100/4 0GB/EIDE	'322"
#90695		Caviar AC22100/2 1GB/EIDE	'199"
#92187		Ma 16XX Series 1.7GB/EIDE	'185"
#90251	Seagate	Barracuda/4 3GB/Ultra SCSI	'794"

OfficeConnect Hubs

as low as
\$68.99



1 Installs in under 10 minutes.
14 SCB 16 RJ-45 10Base-T connectors
14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

14 SCB 16 RJ-45 10Base-T connectors

ViewSonic PT813 21" Color Monitor

Award-winning Image Quality for a Great Price!



21" CRT (20" viewable)
1600 x 1280 Max resolution @ 65Hz
28mm AG pitch

\$1,699.99
#90067

Order#	Product	Price
#96126	E655 15" CRT, 28dp, 1280 x 1024	'299"
#81042	17EA 17" CRT, 28dp, 1280 x 1024	'599"
#92529	E641 14" CRT, 28dp, 1024 x 768	'239"
#97587	G771 17" CRT, 27dp, 1024 x 768	'619"
#96257	15GA 15" CRT, 27dp, 1024 x 768	'419"
#94013	G775 17" CRT, 25dp, 1280 x 1024	'729"
#87897	G880 20" CRT, 28dp, 1600 x 1280	'1,129"
#87897	G810 21" CRT, 25dp, 1600 x 1200	'1,249"

PC Mall's Personal Account Executive Service!

One number to call.
One person to talk to.
At PC Mall, your Personal Account Executive will handle every aspect of your account.



When you call PC Mall, you get your own Personal Account Executive. They'll handle everything from product advice to making sure your order is delivered on time. Call us and discover why thousands of PC users already insist upon PC Mall for their PC equipment.

We'll Beat Any Computer Price!

We offer the lowest computer prices in the business! Just try us! See a system you want listed for less somewhere else? Call us up, let us know and we'll beat it.

Fastest Overnight Delivery!

Order as late as 11:00 p.m. EST and we'll deliver it to you via FedEx by 10:30 a.m. the next day.

Over 35,000 Products!

Forget running from store to store. With our enormous selection of name-brand products, we're your one-stop shop for everything from the hottest desktops, notebooks and software to memory upgrades and video cards, cables and printer supplies.

Custom Configuration!

Pick your RAM, hard drive size, video card, even any software you'd like pre-installed and have our technicians configure your system for you. Simply take your system out of the box, plug it in, and you're in business.

Order On-Line!

Come visit our newly redesigned, constantly updated Web site at <http://www.pcmall.com>! You can check prices, order products and even order software electronically using our ESD service!

No Credit Card Surcharges



We accept Visa, MasterCard, American Express and Discover! Open Account • We accept P.O.s. Call us today to set up an account!

Leases • Lease anything from one PC to one hundred for truly affordable rates!

Volume Licensing • Supply your entire office with the latest software versions for less!

Prices and specifications subject to change without notice. Limited to stock on hand. *IMPORTANT! While we do our best to check errors, mistakes may occur—call to verify pricing.

Call Today to get Your FREE PC Mall and DataCom Mail Catalogs!



PC Mall

Use Source Code #ZPCM791

CALL 1-888-901-MALL
Toll-Free

CIRCLE 330 ON READER SERVICE CARD

www.pcmall.com

PCTech Ask Our Advisors

format the list as a bulleted list first—rather than formatting it as numbered and then changing it to bulleted—Word asks whether to keep the leading numbers. This behavior makes a simple workaround possible.

To protect the leading numbers in a numbered list, select the list and give the command to format it as a bulleted list—using either the toolbar button or the menu choices. When Word asks whether to replace the existing numbers with bullets, answer No. Then, with the list still selected, format it as a numbered list. Word will convert the bullets to numbers, and it will leave the leading numbers for the items untouched.

You can then change the numbering format—to Roman numerals, for example—without losing the leading numbers on any of the items. You can also add more items at the beginning, end, or middle of the list, without losing leading numbers in the new items.

Another way around the problem is to turn on the automatic numbering before you enter the list items. Start with a blank line for the first item, and format it as a numbered list. Each time you hit Enter to start a new paragraph, Word will add a number at the beginning of the new paragraph and let you enter leading numbers for that paragraph if you like.

To stop the numbering and return to body text in Word 6 or later, simply start a new paragraph at the end of the list and turn off automatic numbering for that paragraph. To turn the feature off, either click on the Numbering toolbar button or choose Format | Bullets and Numbering, then Remove. Alternatively in Word 7 and Word 97, you can hit Enter a second time. This will start a new unnumbered paragraph and remove the automatic numbering from the previous blank paragraph.—*M. David Stone*

SPREADSHEETS

Rounding to Taste

I am trying to use Excel to convert millimeters into inches. I can apply the standard conversion factor—25.4001 millimeters per inch—with no problem. But I need to round the result to the nearest 1/16 inch. Does Excel have a function that will do that? If it doesn't, what kind of formula should I use?

STEVEN EDWARDS
via the Internet

PC MAGAZINE: Excel's Analysis ToolPak includes an MROUND function, which rounds any number to a multiple that you specify. If your millimeter value is in A1, you can con-

vert it to inches and round to the nearest sixteenth by writing

=MROUND(A1/25.4001, .0625)

You can then apply a fractional display format to the cell containing this formula. To do this, select the cell and choose Format | Cells, then on the Number tab select Fraction and "As sixteenths."

If MROUND gives you a #NAME? error, you don't have the Analysis ToolPak installed. Choose Add-Ins from the Tools menu, then mark the Analysis ToolPak check box. Note that Excel 97 includes an Analysis ToolPak—VBA add-in as well as the worksheet Analysis ToolPak. If MROUND gives you a #VALUE! error, Excel is probably trying to get the MROUND function from the VBA add-in instead of the worksheet add-in. Go back to the Add-Ins dialog box and make sure you've installed Analysis ToolPak, not Analysis ToolPak—VBA. If you have both installed and you're getting the #VALUE! error, deselect the VBA add-in and re-enter your formulas. You can then reinstall the VBA add-in.

Quattro Pro and 1-2-3 have equivalent functions. Quattro Pro's, like Excel's, is called MROUND; 1-2-3's is called ROUNDM.—*Craig Stinson*

DATABASES

Running Totals in Queries

I know there are ways to create a running total in a query in Microsoft Access, but they normally total the whole returned data set. What

I'm trying to create is a query that has a calculated running-total field that's reset for each change in a reference field. Something like this, for example:

Reference	Value	Running Total
Ref1	10	10
Ref1	10	20
Ref1	10	30
Ref2	5	5
Ref2	5	10
Ref2	5	15

I've tried modified DLookups, DSums, and a simple accumulation module referenced in the query, all without success. Any suggestions would be appreciated.

STEVEN KUMBSKY
via the Internet

PC MAGAZINE: If your source table is structured as you suggest and has an additional column that orders the rows to be summed, a single select query can produce the result you want. You need the ordered column for a WHERE clause that says in effect, "Give me the total for all rows that come before and include this one." The SQL statement, assuming the presence of an ordered column called Number, would look like this:

```
SELECT T0.Reference, T0.Value,
(SELECT SUM(Value) FROM [Table] As T1
WHERE T1.Reference = T0.Reference And
T1.Number <= T0.Number) AS
RunningTotal
FROM [Table] AS T0;
```

```
Function GetLineItemNumber(vKey As Variant) As Long
' *****
' Function GetLineItemNumber (vKey As Variant) As Long
' Return the next incremental line item number for the passed key.
' *****

Static vLineItemKey As Variant
Static lLineItemNumber As Long

If vKey <> vLineItemKey Then      ' If the key has changed
    lLineItemNumber = 1           ' Reset the line number
    vLineItemKey = vKey          ' Store our new key
Else
    lLineItemNumber = lLineItemNumber + 1 ' Compute the next number
End If

GetLineItemNumber = lLineItemNumber ' For return to caller

End Function
```

FIGURE 2: This function is used in the Make Table query in the example to add line-item numbers to an Order Details table, for use in creating a select query that produces running totals.

PCTech Ask Our Advisors

If your source table doesn't have a column that orders the rows to be summed, then you need to create a new copy of the table that does and to employ that column as the source for the query. Obviously this requires enough available disk space to store another copy of the table.

Before going any further I want to point out that for most purposes, the Access report designer is the place to do running totals, because it has built-in support for them. For instance, to create a running sum on a report, just add a text box for the value you want to sum and then change the RunningSum property to either Over Group or Over All. The first choice, Over Group, resets the running sum at the end of each group (in your case, each reference). The second, Over All, keeps accumulating the running sum until the end of the report. Because running sums are so easy to produce using the report designer, you might want to consider using your query as

Order ID	Product ID	Unit Price	Quantity	Total	Running Total Order
10000		\$27.00	4	\$108.00	\$108.00
10001	25	\$9.80	30	\$294.00	\$294.00
10001	40	\$12.80	40	\$512.00	\$806.00
10001	80	\$36.50	8	\$308.00	\$1,114.00
10001	84	\$23.00	15	\$345.00	\$1,459.00
10002	31	\$8.00	35	\$280.00	\$280.00
10002	39	\$12.60	18	\$226.80	\$506.80
10002	71	\$15.00	15	\$225.00	\$731.80
10003	18	\$43.70	12	\$524.40	\$524.40
10004	29	\$85.00	35	\$3,010.00	\$3,010.00
10004	85	\$30.70	6	\$184.20	\$3,194.20
10005	62	\$34.00	6	\$204.00	\$204.00
10006	13	\$4.20	10	\$42.00	\$42.00

FIGURE 3: If your table includes a column that orders the rows to be summed, you can create a query that includes a running sum like the one shown here.

the record source for a report that produces running totals.

To produce running totals using a query, you need some way to tell the query to sum only those rows processed thus far. Let's consider an example of an Invoice Details table that has the following columns:

Order ID
Product ID
Unit Price
Quantity

In this example the rows to be summed are those for each Order ID, which represent line items on an invoice. To produce a sum for each invoice based on Order ID, you could use the following query:

```
SELECT T0.[Order ID], T0.[Product ID],
T0.[Unit Price], T0.Quantity,
(SELECT SUM([Quantity]*[Unit Price])
FROM [Order Details] As T1
WHERE T1.[Order ID] = T0.[Order ID])
```

```
AS InvoiceTotal
FROM [Order Details] AS T0;
```

The inner query has the job of producing the sum for the invoice, which it returns to the outer query. The result is that the total invoice is shown on each row in the result, like this:

Order ID	...	InvoiceTotal
10000	...	\$108.00
10001	...	\$1,459.00
10001	...	\$1,459.00
10001	...	\$1,459.00
10001	...	\$1,459.00
10002	...	\$731.80
10002	...	\$731.80

This clearly isn't a running sum though. What's needed is some way to restrict the inner query to only those rows processed thus far, but there is no way to do this using only the four columns in our Invoice Details table.

If we add a column that numbers the rows sequentially, however, such a clause becomes possible.

To get a new table with the added column, devise a Make Table query that selects all the columns from the Invoice Details table and adds a new one based on a custom function to number the rows. The GetLineItemNumber function shown in Figure 2 can be

used to number the items to be summed. You pass this function the Order ID and it returns the next sequential line item number. The Make Table query for the example Invoice Details table looks like this:

```
SELECT DISTINCTROW [Order
Details].[Order ID],
[Order Details].[Product ID],
[Order Details].[Unit Price],
[Order Details].Quantity,
GetLineItemNumber([Order ID]) AS
LineNumber
INTO [Running Totals Source]
FROM [Order Details]
ORDER BY [Order Details].[Order ID];
```

Note the INTO clause, which creates the new table. When you run this query, it creates the "Running Totals Source" table, which we'll use as the source table to produce running totals. It includes all of the columns from the original table plus the new LineNumber column. The LineNumber column numbers

the line items on each invoice like this:

Order ID	...	LineNumber
10000	...	1
10001	...	1
10001	...	2
10001	...	3
10001	...	4
10002	...	1
10002	...	2

Now that you have a LineNumber column to order the rows to be summed, you can use that to restrict the inner query. The following example draws from the Running Totals Source table to produce running totals:

```
SELECT DISTINCTROW T0.[Order ID],
T0.[Product ID], T0.[Unit Price],
T0.Quantity,
[Unit Price]*[Quantity] AS Total,
(SELECT SUM([Quantity]*[Unit Price])
FROM [Running Totals Source] As T1
WHERE T1.[Order ID] = T0.[Order ID]
And T1.[LineNumber] <=
T0.[LineNumber])
AS [Running Total Order]
FROM [Running Totals Source] AS T0;
```

The results from this query are shown in Figure 3. An example database containing the queries discussed here and sample data can be downloaded from PC Magazine Online (see the sidebar "Getting the Files" in this issue's Utilities column for instructions). Look for Runtot.mdb in the issue archive file.

—Sal Ricciardi

HOW TO CONTACT US

Send your tips and questions to our advisors in any of the following ways:

E-MAIL pctech@zd.com

FAX 212-503-5799

MAIL Solutions, PC Magazine, One Park Ave., New York, NY 10016-5802 (Please send a floppy disk and a printout.)

COMPUERVE To reach individual editors as listed on ZD Net, type GO PCMSTAFF.



If we print your tip, you'll receive \$50 plus a PC Magazine T-shirt. We regret that we cannot answer letters individually.



DIRT CHEAP DRIVES

1-800-786-1173

Celebrating our 10th year!
Low Low Prices!
We stock what we sell!



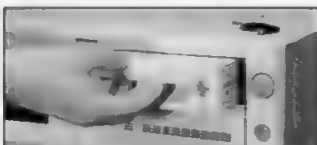
BEST BUY CD RECORDERS
TOLL FREE SUPPORT
5 FREE DISKS

2x6 SCSI CD ROM RECORDER	
• Packet write compatible, tray loading	
Drive Kit	\$369
Complete Kit with ISA controller	\$399
Complete Kit with PCI controller	\$469
4x6 SCSI CD ROM RECORDER	
• Packet write compatible, tray loading	
Drive Kit	\$589
Complete Kit with ISA controller	\$639
Complete Kit with PCI controller	\$709
2x8 IDE CD ROM RECORDER	
• Packet write compatible, tray loading	
Drive Kit	\$439
Complete Kit with ISA controller	\$469
NEW 2x6 SCSI CD ReWritable!	
• CD-R and CD-RW compatible	
• Includes 5 rewritable disks	
Drive Kit	\$569
Complete Kit with ISA controller	\$639
Complete Kit with PCI controller	\$689

(Drive kit - requires controller)

We will not be undersold on CD media!		
CDR-74 (with jewel case)	Alone	With CDR
5 pack (CDR74-5)	\$28	\$25
20 pack (CDR74-20)	\$80	\$75
50 pack (CDR74-50)	\$188	\$178
100 pack (CDR74-100)	\$350	\$340
CDR-74 (no jewel case)		
50 disk spindle (CDR74-50)	\$225	\$220
CDR-74W (ReWritable)		
5 pack (CDR74W-5)	\$119	\$115
20 pack (CDR74W-20)	\$399	\$394
50 pack (CDR74W-50)	\$999	\$989

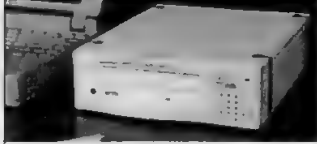
Call for larger quantity pricing



Converts any 3 1/2" hard drive into a removable drive. Great for transportability, data interchange, or security needs. Mount any 3.5" IDE or SCSI drive in the supplied cartridge, and the frame in a 5.25" drive bay in your computer and you are ready for transportability. Extremely high quality construction. Features built in cooling fan, SCSI ID switch

IDE	\$79	Extra frame	\$49	Extra cartridge	\$39
SCSI	\$85		\$54		\$40
WIDE SCSI	\$129		\$75		\$64

Weather resistant cartridge carrying case \$30



High quality external storage solutions available in parallel or PCMCIA (type 2) interface			
Hard Drive	Parallel	PCMCIA	
1.6GB	\$315	\$415	
2.5GB	\$365	\$465	
3GB	\$415	\$515	
4GB	\$515	\$615	
5GB	\$595	\$695	

CD ROM			
16x	\$295	\$395	
24x	\$185	\$285	

DVD
HITACHI
CD-2000

- Supports CDR, and CDRW media
- IDE interface
- DVD-2 Reader, 150ms
- 20X CD ROM, 90ms

Bare Drive \$249
Drive with PCI DVD/MPEG-2 decoder \$479

IDE HARD DRIVES

IDE	RPM	Brand	Model	Price
1200MB	5400	Fujitsu	M1636T	\$165
1275MB	4900	Seagate	ST31277A	\$160
1281MB	5200	Western Digital	AC11200	\$152
1300MB	4200	ITS	JTS1300	\$155
1624MB	5200	Western Digital	AC21600	\$167
1700MB	5400	Fujitsu	M1623T	\$165
1700MB	4900	Seagate	ST31720A	\$165
1750MB	4400	Maxtor	M81750A	\$179
1750MB	5400	Fujitsu	MP3017A	\$169
2000MB	4900	ITS	JTS2000	\$175
2100MB	5400	Fujitsu	M1624T	\$173
2000MB	4200	Western Digital	AC22000	\$177
2100MB	4480	Maxtor	M82100A	\$189
2132MB	4500	Seagate	ST32132A	\$179
2151MB	5400	Quantum	FB32160A	\$187
2500MB	5400	Fujitsu	M1638T	\$192
3100MB 5200		Micropolis	MC4515A	\$203
2557MB	12ms	Seagate	ST32557A	\$203
2559MB	5200	Western Digital	AC22500	\$197
2560MB	4900	Maxtor	M82560A	\$209
2620MB	5400	Fujitsu	MP3026A	\$196
3000MB	4500	ITS	JTS3000	\$199
3166MB	5200	Western Digital	AC33100	\$217
3228MB	4400	Quantum	FB33240A	\$222
3245MB	4900	Seagate	ST33240A	\$229
3300MB	4480	Maxtor	M83300A	\$231
3300MB	4900	Fujitsu	MP3035A	\$217
4000MB	5200	Western Digital	AC34000	\$277
4000MB	5200	Micropolis	MC4540A	\$249
4111MB	4400	Quantum	FB34320A	\$265
4326MB	4500	Seagate	ST34340A	\$295
4335MB	3000	Quantum	BF4335A	\$225
4370MB 5400		Fujitsu	MP3043A	\$242
4300MB	5200	Micropolis	MC4550A	\$329
5120MB	4400	Maxtor	M85120A	\$368
5160MB	4900	Western Digital	AC35100	\$367
6250MB 5400		Fujitsu	MP3052A	\$365
6448MB	5400	Quantum	FB36480A	\$398
6450MB	5400	Seagate	ST56450A	\$429
6480MB	3600	Quantum	BF6480A	\$339

SCSI HARD DRIVES

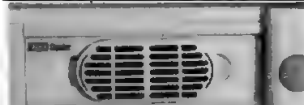
Add a DPT 2044U Ultra SCSI controller \$249

SCSI	RPM	Brand	Model	Price
1050MB	5400	Seagate	ST31055N	\$242
2150MB	5400	Seagate	ST52160N	\$275
2150MB	7200	Seagate	ST52171N	\$479
2151MB	5400	Quantum	FB32160S	\$239
3228MB	5400	Quantum	FB32450A	\$305
4100MB 7200		Micropolis	MC4341	\$549
4300MB	5400	Micropolis	MC4743	\$369
4310MB	5400	Quantum	FB34320S	\$369
4350MB	7200	Seagate	ST43571N	\$709
4400MB	7200	Fujitsu	M2954S	\$575
4550MB	7200	Micropolis	MC4345A	\$599
4550MB	7200	Micropolis	MC4345AV	\$685
4550MB	7200	Quantum	XP34550S	\$735
4550MB	10,000	Seagate	ST34501N	\$859
6448MB	5400	Quantum	FB36480S	\$479
9100MB 7200		Micropolis	MC3391	\$985
9100MB	7200	Fujitsu	M2949S	\$995
9100MB	7200	Quantum	XP39100S	\$1115
9100MB	7200	Micropolis	MC3391AV	\$1119
9100MB	7200	Seagate	ST19171N	\$1169
9100MB	10,000	Seagate	ST19101N	\$1479
23300MB	5400	Seagate	ST423451N	\$2669

WIDE HARD DRIVES

Add a DPT 2044U Ultra Wide SCSI controller \$279

WIDE	RPM	Brand	Model	Price
1050MB	5411	Seagate	ST31055W	\$329
2150MB	7200	Seagate	ST52171W	\$515
4294MB 7200		Micropolis	MC3243W	\$829
4294MB	7200	Micropolis	MC3243WAV	\$789
4350MB	7200	Seagate	ST34371W	\$750
4400MB	7200	Fujitsu	M2954W	\$599
4550MB	7200	Micropolis	MC4345W	\$619
4550MB	7200	Micropolis	MC4345WAV	\$709
4550MB	7200	Quantum	XP34550W	\$735
4550MB	10,000	Seagate	ST34501W	\$889
9091MB 5400		Micropolis	MC3391W	\$1039
9091MB	5400	Micropolis	MC3391WAV	\$1139
9100MB	7200	Fujitsu	M2949W	\$1049
9100MB	7200	Quantum	XP39100W	\$1115
9100MB	7200	Seagate	ST19171W	\$1229
9100MB	10,000	Seagate	ST19101W	\$1459
23300MB	5400	Seagate	ST423451W	\$2599



Hard Drive Cooling Fan Mounts in a 5 1/4" half height drive bay. Compatible with any 3 1/2" hard drive. Features twin cooling fans and a washable air filter. A must for 7200 and 10,000 RPM drives. (CHDFAN) \$30

CD ROM DRIVES

IDE CD ROM				
Speed	Brand	Model	ms	Int
12X	Toshiba	XMS702B	115	\$98
16X	Delta	DELTA16X	120	\$79
16X	Lite On	LTN262A	120	\$89
16X	Toshiba	XM6002B	90	\$91
16X	Mitsumi	CMC616X	120	\$92
16X	NEC	CDR1600	100	\$95
18X	Acer	AC616A	120	\$92
20X	Lite On	LTN202A	120	\$94
24X	Delta	DELTA24X	99	\$89
24X	Panasonic	CR585	85	\$109
24X	Toshiba	XM6102B	85	\$122
IDE CD CHANGERS				
Speed	Brand	Model	# Disks	Int
6X	NEC	CDR4X6	4	\$89
8X	NEC	CDR4X8	4	\$119
12X	Panasonic	SQTC512N	5	\$269

IDE CD CHANGERS

Speed	Brand	Model	# Disks	Int
6X	NEC	CDR4X6	4	\$89
8X	NEC	CDR4X8	4	\$119
12X	Panasonic	SQTC512N	5	\$269

ACCESSORIES

Buy a CD drive & sound card & get a FREE audio cable.
Creative Labs Sound Blaster 16 Value PnP (SBIDE) \$75
Creative Labs Sound Blaster AWE64 (SB64AWE) \$100
Creative Labs Sound Blaster AWE64 (SB64AWE) \$180
Professional speakers with Bose style swivel speakers and separate subwoofer.
25 Watt (SPEAKER) \$99 35 Watt (SPEAKER) \$129
Universal sound cable (AUDIOMIX) \$9
Turn any IDE CD ROM into an external for parallel printer port (PPCASECD) \$99
Turn any IDE CD ROM into an external for PCMCIA port (PCMCIACASECD) \$189

SCSI CD ROM

Speed	Brand	Model	ms	Int
12X	Toshiba	XMS701B	115	\$149
12X	Plexstor	PK12TS(tray)	105	\$109
12X	Plexstor	PK12CS(caddy)	105	\$259
15X	Toshiba	XMS801B	99	\$159
16X	NEC	CDR1610	100	\$159
20X	Plexstor	PK20TS	95	\$235

SCSI CD CHANGERS

Speed	Brand	Model	# Disks	Price
4X	Pioneer	DRM624X	6 (ext)	\$389
16X	Nakamichi	MJS16	5	\$239

SCSI CD TOWERS

Speed	Brand	Model	Price
15X	Toshiba	99ms	\$999
16X	NEC	100ms	\$929
20X	Plexstor	95ms	\$1399

SCSI CD TOWERS w/ 5 Disc Changers

Nakamichi 16X 150ms	\$1399	\$2399
---------------------	--------	--------

CD RECORDERS

Sony 2x6	
Internal SCSI drive (CDU926S)	\$339*
Yamaha 4x6	
Internal SCSI drive tray load (YCDR400T)	\$539*
Internal SCSI drive caddy load (YCDR400)	\$549*
Philips 2x6	
Complete kit includes software, and 1 disk	
Internal SCSI (CDD2600)	\$439
Hewlett Packard SureStore 6020i	
SureStore 6020i includes software, and 1 disk	
Internal SCSI (C4343CDR)	\$369
Complete internal kit w/ controller (C4343CDR-1)	\$409
External for parallel printer port (C4345A)	\$545
Sony 2x8	
Internal IDE (CDU928S)	\$399*
Kit w/ 1 disk, and software compatible with Win 95 & Win NT 3.51 & Req. IDE controller (CDU928SKIT)	\$429
Mitsumi 2x6	
IDE kit includes 3 disks, and software compatible with Win 95 & Win NT 3.51 & Req. IDE controller	\$420
Internal (CRM2600TE)	

*Drive must be purchased with CDR software or media.

ULTRA IDE HARD DRIVES

FUITSU	Model	Price
1750MB 10ms	MP3017U	\$174
2620MB 100ms	MP3026U	\$201
3300MB 10ms	MP3035U	\$222
4370MB 10ms	MP3043U	\$247
5250MB 10ms	MP3052U	\$314
QUANTUM		
2151MB 10ms	FB32160A	\$187
3228MB 10ms	FB33240A	\$222
4310MB 10ms	FB34320A	\$265
6448MB 10ms	FB36480A	\$365
MAXTOR		
7000MB 10ms	M87000A	\$462
WESTERN DIGITAL		
5160MB 12ms	AC35100	\$367
Promise PCI Ultra IDE Controller (ULTRA33)		\$69

We also stock: IDE and SCSI controllers, Media for all drives, Backup software, CDR mastering and encryption software, CD Duplicators, CD Towers, Jukeboxes (CD, CDR, tape, optical), RAID controllers and cases, Drive Cases, CD Labeling systems, plus much more. **CALL!**
We also: Install any of these drives in external enclosures, and custom configure to your specifications.

TAPE DRIVES

EXARYTE		
3.5-7Cig	8mm, 32MB/min, EXB8205XL	\$1189
7-14Cig	8mm, 120MB/min, ELANT820	\$1549
7-14Cig	8mm, 60MB/min, EXB8700LT	\$689
7-14Cig	8mm, 60MB/min, EXB8700	\$899
(EXB8700 includes 1 tape 1 cleaning tape, and backup software)		
20-40Cig	8mm, 360MB/min, EXB8900	\$3769
70-140Cig	8mm, 60MB/min, EXB10H	\$4239
HEWLETT PACKARD		
2Cig	DAT, 11MB/min, C1534A	\$579
2-4Cig	DAT-DC, 42MB/min, C1536A	\$899
4-8Cig	DOS-2 DAT, 60MB/min, C1599A	\$859
12-24Cig	DOS-3 DAT, 120MB/min, C1534A	\$1249
72-140Cig	DOS-3 DAT, 120MB/min, C5648A	\$2779
SEAGATE		
2-4Cig	DAT-DC, 66MB/min, STD24000N	\$599
4Cig	Mini, 29MB/min, TST8000	\$339
4-8Cig	DOS-2 DAT, 48MB/min, C4326RP	\$739
12-24Cig	DOS-3 DAT, 132MB/min, STD24000N	\$1059
48-96Cig	DOS-2 DAT, 48MB/min, C4586NP	\$1879
SEAGATE MINI CART		
Prices include Dos/Win backup software & 1 tape		
800MB	TR1, TST800R	399
3.2Cig	TR4, TST3200	\$179
4-8Cig	TR3, TST8000 IDE or SCSI	\$189
SONT		
4-8Cig	DOS-2 DAT, 44MB/min, SDT5000A	\$789
4-8Cig	DOS-2 DAT, 90MB/min, SDT7000A	\$849
12-24Cig	DOS-3 DAT, 144MB/min, SDT9000A	\$1049
32-64Cig	DOS-2 DAT, 90MB/min, TSL7000X	\$2129
QUANTUM		
15-30Cig	DLT 150MB/min, DLT2000XT	\$2679
20-40Cig	DLT 180MB/min, DLT4000	\$4099
75-150Cig	DLT loader, 150MB/min, DLT2500XT	\$4949
100-200Cig	DLT loader, 180MB/min, DLT4500	\$5999

Working to Earn Brand Names. Best Values!

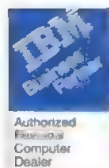


ONLY \$1899
Order #44989

TOSHIBA

Satellite 220CDS

- 133MHz Intel® Pentium® processor
- 1.34GB hard drive
- 16MB RAM standard, expandable to 144MB
- 10X CD-ROM
- 12.1" SVGA dual-scan display
- 32-bit advanced graphics acceleration
- 16-bit stereo sound



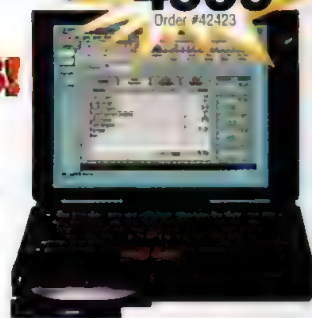
HUGE SAVINGS!

**Was \$6249.
SAVE \$1250!**

ThinkPad 760XD

- 166MHz Intel® Pentium® processor with MMX™ technology
- 3.0GB hard drive
- 32MB RAM standard, expandable to 104MB
- 12.1" XGA TFT screen
- 8X CD-ROM standard

For a limited time only!



NOW ONLY \$4999
Order #42423

COMPAQ

Presario 4504 Tower

- 200MHz Intel® Pentium® processor
- 16MB RAM, expandable to 48MB
- 2.1GB hard drive
- 64-bit graphics and 1MB VRAM
- 33.6/14.4 Kbps data/fax modem
- Internet Button for one-touch Internet access!
- 16X CD-ROM drive

HOT PRICE!

\$999⁹⁸

For a limited time only!

Monitor sold separately



PHILIPS

Velo 1 Handheld PC

- Full Windows CE functionality
- 4MB DRAM, expandable to 36MB, or 100MB with DRAM and FlashRAM!
- Records up to 16 minutes of voice memos
- Built-in 19.2 Kbps modem and phone jack

"It's the fastest, most expandable, most richly configured and best-designed unit..." - PC Magazine

ONLY \$739⁹⁸
Order #42941



Check checkbook size!



Stylus Photo

- Vivid 6-color technology & true 720 dpi res.
- Smooth gradations and virtually continuous tone
- Prints up to full 44" panoramic images!

ONLY \$499⁹⁸
Order #40918

Affordable storage for today's home PC user!



ONLY \$159⁹⁸
Order #42595

- EIDE-2/Fast ATA-2 interface
- Speedy 14ms access speed
- 4103RPM
- 32K cache
- Backed by a three-year warranty

Microsoft®

FREE SHIPPING!

Order ANY Microsoft product from The PC Zone by Sept 31, 1997 and get **FREE GROUND SHIPPING!** *Up to seven pounds.

\$100 REBATE!

Windows NT Server 4.0

Version Upgrade with 5 client licenses

ONLY \$289⁹⁸*

Order #50416



*After \$100 Zone Mail-in Rebate. Rebate offer good thru 9/30/97. Low Zone Price \$389.98



Office 97 Pro

Competitive/Version Upgrade with Bookshelf Basics

ONLY \$259⁹⁸*

Order #40207

*After \$40 Mfr. Mail-in Rebate. Low Zone Price: \$299.98

HYUNDAI

Deluxe Members

DeluxScan 14S 14" Monitor

- 28mm dot pitch
- 1024x768 maximum resolution at 60Hz refresh
- Energy Star VESA DPMS compliant

ONLY \$169⁹⁸
Order #83278



Robotics

The most powerful home entertainment system

Sportster 56K Internal Faxmodem

- Fast 56K download speeds!
- Compatible with all current modems

*After \$50.00 Mfr. Mail-in Rebate. Low Zone Price: \$199.98

Current regulations limit transmission to 53 Kbps



ONLY \$147⁹⁸*
Order #78044

Kodak

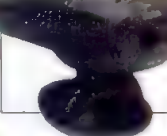
digital science SOLUTIONS

DVC300 Digital Video Camera

ONLY \$199⁹⁸

Order #44533

- Rich, 24-bit color still image resolutions up to 640x480
- Lifelike digital video resolutions up to 320x240
- USB interface only
- Digital zoom and auto exposure



visioneer

PaperPort Strobe

- 24-bit color scanning
- 300x600 dpi resolution
- Compact Color Scanner

ONLY \$299⁹⁸
Order #45653



FREE CATALOG!

Call Today

1-800-258-8088

Visit our Internet Superstore @ www.pczone.com

Corporate, Education and Government bids welcome! Fax your purchase orders to 1-425-430-3420

Credit cards are not charged until the order is shipped. Most products ship the same day (during system failure, etc.). Shipping options include Ground, 2nd Day and Overnight delivery. Freight is based on average product weight. Handling extra insurance available. Special order items require special shipping and handling charges. Please call for international shipping rates. Prices and product availability subject to change without notice. Specials and promotions may be limited to stock on hand. Not responsible for typographical errors. © 1997 Multiple Zones International, Inc. All rights reserved. Unauthorized duplication is a violation of applicable laws. Data Commercial Credit Business Lease: 36-month fixed payment, lease with \$1 purchase option based on approved credit (1250 minimum lease amount). Other leasing options available. Administered by Data Commercial Credit Corporation.

Your Business

“ An office solution wouldn't be complete without computing accessories – toner cartridges, media, cables, keyboards; everything you need to be productive. You can find these indispensable products at The PC Zone – the place for one-stop computer shopping. With over 20,000 products, available overnight delivery and phone or Internet shopping, you never have to leave your office to order. And if you're not sure what you need, our sales advisors are here to help anytime, day or night. **”**

Jeanette F.
Business Manager
The PC Zone



APC
AMERICAN POWER CONVERSION

Back-UPS Office

- Six-outlet full-time protection with three-outlet battery backup against power surges, spikes, blackouts and brownouts
- Solid power protection for all Internet and network workstations

ONLY
\$139⁹⁸
Order #85595

*After \$30 Mt. Main
Rebate. Allowance
Prize: \$169.98
Expires 9/30/97

Brand-name printer supplies

HP HEWLETT
PACKARD

NEC



Canon

OKIDATA



**HP LaserJet Toner for
LaserJet 4L/P, 4L/MP**

- Outputs an amazing 3,000 pages!
- Delivers sharp text and graphics on every page
- Environmentally friendly no-mess packaging

ONLY
\$69⁹⁸
Order #89885

EPSON

LEXMARK

ADVANCE THE ART OF PRINTING



Huge variety of storage media



NOMAI
Advanced on the corner

HP HEWLETT
PACKARD

SyQuest



**Verbatim CD-R
74-Min 4x**

- Stores 680MB of data on a single CD!
- Records up to 74 minutes of JPEG movies or CD audio
- Records at 4x speed

ONLY
\$4⁹⁸
Order #21922

KAO

Verbatim.



SONY



Incredible selection of input devices



LOGITECH

WACOM

ADESSO

visioneer

caere



Kensington Orbit

- The innovative NEW alternative to a mouse or trackball
- Delivers fast, accurate cursor control
- Streamlines many tasks including an automatic double-click

ONLY
\$59⁹⁸
Order #44549

KENSINGTON

PERF. XMANITZ.

CalComp

NO SURCHARGE on CREDIT CARDS

Circle 068 on your reader service card
or go to WWW.PCMAG.COM/ProductLink

**SOURCE CODE
PM709**

**Earning your business
takes commitment.**

That's why we study the marketplace every day to bring you the best product values on the brand names you know and trust. It's our commitment to offering you high-quality products, low prices, and excellent service that will keep you coming back.

Working for you...

Jeanette specializes in finding those "must-have" computer products at prices that make sense to small business owners. By staying current with industry trends, customer needs and new technologies, Jeanette is able to offer an impressive selection of computer peripherals to satisfy the needs of even the most unique businesses. Jeanette and The PC Zone take pride in being the best choice for easy and affordable one-stop-shopping. Give us a call!



**We offer more than
20,000 products.
If you don't see what you
want, give us a call!**

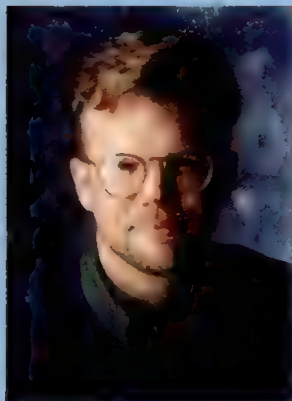
1-800-258-8088

A MCBARQ COMPANY Ticker Symbol MZON

Insight

America's discount source for computers, hardware and software

Everything you need



Got Better Things To Do?

"Sure you do! You've got better things to do than to spend your time trying to make

your system work. So

let us do it for you. We have the trained technicians and the quality-controlled environment to do the job right — from the start! Upgrade your memory, install software correctly, add the right hardware — we do it all. So call us to get the system you want just the way you want it by people who know their stuff."

Chris Speers

MANAGER, INTEGRATION CENTER



Western Digital

Ultra DMA/33 with SDX!

5.1GB Ultra IDE Hard Drive

- 5160MB capacity
- 12ms access time
- 128K cache
- 5400RPM
- 1.5" form - 1" height
- 33.3MB/second max. transfer rate
- Ultra DMA IDE interface

\$379.99

WD35100AB



Double your speed! 33.3MB/SEC. Transfer Rates!

Microsoft

Office 97 Standard Edition Upgrade

Get Organized. Get Connected. Get Results. Integrates intelligent applications with the power of the Internet so you can get your job done faster and more effectively than ever before

- Word 97
- PowerPoint 97
- Excel 97
- Outlook 97
- Internet Explorer



*208.00 - \$40 =

\$168.00

MS752237



HEWLETT PACKARD

LaserJet 6LXI Printer

HP's most affordable laser printer for business!

- 6ppm, fast return to application with 18-sec. first page out
- 600 dpi for crisp, clear output with HP's exclusive Resolution Enhancement technology (RET)
- Includes the HP Internet Custom News Kit
- 1 year manufacturer's warranty with HP Express Exchange



\$389.99

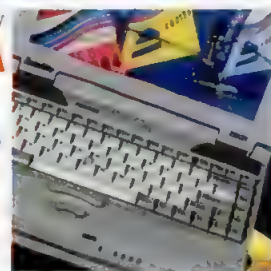
HP LJ6 LXI

In Touch with Tomorrow TOSHIBA

NEW Toshiba Quality Under \$2000!

Satellite 220CDS

- 133MHz Pentium® processor with 256K L2 cache
- 12.1" Dual Scan display
- 16MB EDO DRAM
- 1.34GB hard drive
- 2MB EDO video
- 10X CD-ROM drive



\$1949.99

TA220CDS

In Touch with Tomorrow TOSHIBA

Network Ready System!

Equium 5160D

- 166MHz Pentium® processor with MMX™ technology
- 32MB EDO DRAM
- 2.07GB hard drive
- 2MB SGRAM video/3D
- 12X CD-ROM drive
- Integrated Intel EtherExpress Pro/100B LAN adapter



\$1599.99

TODT1022U

800-INSIGHT
www.insight.com

For faster service mention this key code when placing your order **MACB**



For wider product selection and more detailed product specifications, visit our Web site at www.insight.com

from start to finish.



Insight is one of only a few peripheral direct marketers to win this coveted PC Magazine Award.

MEMORY UPGRADES

PNY Industry Standard Memory DIMM	16MB	32MB
72-Pin, 60ns (non-parity)	PC7232-60 ... \$39.99	PC7232-60 ... \$49.99
72-Pin, 60ns (parity)	PC7232-60 ... \$39.99	PC7232-60 ... \$49.99
72-Pin 60ns, EDO	PC7232-60E ... \$39.99	PC7232-60E ... \$49.99

Kingston Notebook Memory DIMM	16MB	32MB
Toshiba Satellite Pro 400, 100CS	KT7400/16 ... \$99.99	KT7400/32 ... \$209.99
Toshiba Tecra 700CT, CS	KT7700/16 ... \$99.99	KT7700/32 ... \$299.99
Toshiba Portégé 610C, Satellite 200, 410, 420	KT610/16 ... \$99.99	KT610/32 ... \$209.99
Toshiba 500CS, CT	KT650/16 ... \$99.99	KT650/32 ... \$209.99
Toshiba Portégé 650CT, 660CT	KT650/16 ... \$99.99	KT650/32 ... \$209.99
AST J10, J30	KI4511 ... \$99.99	KI4511 ... \$209.99
AST P38, P40, P50	KI4511 ... \$99.99	KI4511 ... \$209.99
Compaq Armada 1100 Series	KI4144/16 ... \$99.99	KI4144/32 ... \$209.99
Compaq Armada 4100 Series	KI4144/16 ... \$99.99	KI4144/32 ... \$209.99
IBM 760 E Series; 560, 365X, SD	KI4144/16 ... \$99.99	KI4144/32 ... \$209.99
NEC Versa 6000 Series	KI4144/16 ... \$99.99	KI4144/32 ... \$209.99
NEC Express 500, 540, 570	KI4144/16 ... \$99.99	KI4144/32 ... \$209.99
NEC Express 600 and 900 Series	KI4144/16 ... \$99.99	KI4144/32 ... \$209.99

SYSTEMS

Equium 5160D, 166MHz Pentium® MMX, 32MB RAM, 2.07GB HDD, 12X CD T00T10220	\$1,599.99
Equium 5200D, 200MHz Pentium® MMX, 32MB RAM, 2.38GB HDD, 12X CD T00T1023U	1,799.99
Equium 6200D, 200MHz Pentium® Pro, 32MB RAM, 2.95GB HDD, 12X CD T00T1025U	2,299.99
Equium 6200M, 200MHz Pentium® Pro, 32MB RAM, 4.24GB HDD, 12X CD T00T1026U	3,199.99

IBM Models	
ActiveX 58C, 166MHz Pentium® MMX™, 32MB RAM, 3.1GB HDD, 16X IBM2162SC	\$1,899.99
ActiveX 59C, 200MHz Pentium® MMX™, 32MB RAM, 4.2GB HDD, 16X IBM2162SC	2,499.99
ActiveX 68C, 166MHz Pentium® MMX™, 32MB RAM, 3.1GB HDD, 16X w/speakers IBM2161CPE	1,899.99
ActiveX 69C, 200MHz Pentium® MMX™, 32MB RAM, 3.1GB HDD, 16X w/speakers IBM2161CPE	1,999.99

Compaq Models	
Deskpro 4000, 166MHz Pentium® MMX, 16MB RAM, 1.62GB HDD 247200-002	\$1,599.99
Presario 4770, 200MHz Pentium® MMX, 32MB RAM, 3.8GB HDD, 16X CD 271150-004	2,299.99

Sony Personal Computer Models	
PCV-130, 200MHz Pentium® MMX™, 32MB RAM, 4.3GB HDD, 24X S0PCV130	\$2,149.99
PCV-150, 233MHz Pentium® MMX™, 32MB RAM, 4.3GB HDD, 24X S0PCV150	2,349.99

MONITORS

Mag Innovation	
DJ530, 15"/13.1" screen/view, 800 x 600 resolution @ 85Hz, 28mm dp MV261639	\$308.99
DJ700, 17"/16.1" screen/view, 800 x 600 resolution @ 85Hz, 26mm dp CM07700	578.99
DJ702E, 17"/16.1" screen/view, 1024 x 768 resolution @ 75Hz, 26mm dp MV64290	558.99
DJ707, 17"/16.1" screen/view, 1024 x 768 resolution @ 85Hz, 26mm dp MV261642	608.99
DJ717, 17"/16.1" screen/view, 1280 x 1024 resolution @ 85Hz, 28mm dp MV261643	734.99
DJ920, 21"/19.8" screen/view, 1280 x 1024 resolution @ 85Hz, 28mm dp CM07920	1,504.99

Princeton	
E040, 14"/13.4" screen/view, 800 x 600 resolution @ 75Hz, 28mm dp CMPE040	\$204.99
E050, 15"/13.8" screen/view, 1024 x 768 resolution @ 75Hz, 28mm dp CMPE050	278.99
E071, 17"/15.8" screen/view, 1024 x 768 resolution @ 75Hz, 28mm dp CMPE071	498.99
E070, 17"/15.8" screen/view, 1024 x 768 resolution @ 75Hz, 28mm dp CMPE070	469.99
E072, 17"/15.8" screen/view, 1024 x 768 resolution @ 75Hz, 28mm dp CMPE072	544.99
E074, 17"/16" screen/view, 1024 x 768 resolution @ 75Hz, 25mm dp CMPE074	628.99
E075, 17"/16" screen/view, 1280 x 1024 resolution @ 85Hz, 26mm dp CMPE075	594.99
E076, 17"/16" screen/view, 1280 x 1024 resolution @ 75Hz, 25mm dp CMPE076	708.99
E090, 19"/18" screen/view, 1280 x 1024 resolution @ 75Hz, 26mm dp CMPE090	879.99

PRINTERS

Hewlett-Packard	
HP DeskJet 692C, 8ppm, 512K, 600 dpi HP40692C	\$299.99
HP DeskJet 870Cxi, 8ppm, 512K, 600 dpi HP40870Cxi	389.99
HP LaserJet 61xi, 8ppm, 1MB, 600 dpi HP4061xi	389.99
HP LaserJet 61xi, 8ppm, 2MB, 600 dpi HP4061xi	759.99

Epson	
Stylus 400, 4ppm, 720 dpi EPS400C	\$199.99
Stylus 600, 6ppm, 1440 dpi EPS600C	299.99
Stylus 800, 8ppm, 1440 dpi EPS800C	419.99
Stylus Photo, 6ppm, 720 dpi EPS1000C	449.99

Canon	
BJC-240, 4ppm, 720 dpi, 620K CMJC240	\$169.99
BJC-4200, 5ppm, 720 dpi, 64K CMJC4200	249.99
BJC-420, 4ppm, 720 dpi, 60K CMJC420	329.99

MODEMS

US Robotics	
Winmodem 33.6, Internal, 33.6/56K/14.4 M05K1125	\$99.99
Sportster 56K, Internal, 56K/14.4 M05K1127	199.99
Sportster 56K, External, 56K/14.4 M05K1126	219.99
Sportster Voice 56K, Internal, 56K/14.4 M05V1168	219.99
Sportster Voice 56K, External, 56K/14.4 M05V1169	229.99
Courier V-Everything, Internal, 56K/14.4 US495463	299.99
Courier V-Everything, External, 56K/14.4 US495469	299.99

HARD DRIVES

Western Digital Hard Drives

1200MB IDE Caviar, 11ms access, 128K cache, 5,200 RPM, 16.6MB/sec WD1120MB	\$165.99
1620MB IDE Caviar, 12ms access, 128K cache, 5,200 RPM, 16.6MB/sec WD1620MB	175.99
2000MB IDE Caviar, 11.5ms access, 128K cache, 5,200 RPM, 16.6MB/sec WD2000MB	185.99
2559MB IDE Caviar, 12ms access, 128K cache, 5,200 RPM, 16.6MB/sec WD2559MB	209.99
3166MB IDE Caviar, 12ms access, 128K cache, 5,200 RPM, 16.6MB/sec WD3166MB	249.99
4000MB IDE Caviar, 12ms access, 256K cache, 5,200 RPM, 16.6MB/sec WD4000MB	329.99
2170MB SCSI Enterprise, 8ms access, 512K cache, 7,200 RPM, 20MB/sec WD2170ES	459.99
4360MB SCSI Enterprise, 8ms access, 512K cache, 7,200 RPM, 20MB/sec WD4360ES	649.99

Seagate Hard Drives

1277MB IDE Modelist, 12ms access, 64K cache, 4,500 RPM, 16.6MB/sec ST1277MB	\$165.99
1700MB IDE Modelist, 12ms access, 128K cache, 4,500 RPM, 16.6MB/sec ST1700MB	175.99
2120MB IDE Modelist, 12ms access, 128K cache, 4,500 RPM, 16.6MB/sec ST2120MB	185.99
2520MB IDE Modelist Pro 2.5, 11ms access, 128K cache, 5,400 RPM, 16.6MB/sec ST2520MB	209.99
3240MB IDE Modelist, 12ms access, 128K cache, 4,500 RPM, 16.6MB/sec ST3240MB	229.99
6450MB IDE Modelist, 9.5ms access, 256K cache, 5,400 RPM, 16.6MB/sec ST6450MB	499.99
10500MB SCSI Hawk 2XL, 9ms access, 512K cache, 5,411 RPM, 20MB/sec ST10500MB	319.99
2149MB SCSI Hawk 2XL, 9ms access, 512K cache, 5,400 RPM, 20MB/sec ST2149MB	389.99
2150MB SCSI Barracuda 4LP, 8ms access, 512K cache, 7,200 RPM, 20MB/sec ST2150MB	499.99
4350MB SCSI Barracuda 4LP, 8ms access, 512K cache, 7,200 RPM, 20MB/sec ST4350MB	749.99
4550MB SCSI Channel, 8ms access, 512K cache, 10,000 RPM, 20MB/sec ST4550MB	919.99
23400MB SCSI Elite 23, 13ms access, 2048K cache, 5,400 RPM, 20MB/sec ST2340MB	2,689.99

NOTEBOOKS

Toshiba

Satellite Pro 220Cxi, 133MHz Pentium®, 12.1" DSTN, 16MB RAM, 1.44GB HDD, 10X 10260Cxi	\$1,949.99
Satellite Pro 430Cxi, 120MHz Pentium®, 11.3" TFT, 16MB RAM, 1.26GB HDD, 10X 10430Cxi	2,199.99
Satellite Pro 440Cxi, 133MHz Pentium® MMX™, 12.1" TFT, 16MB RAM, 1.44GB HDD, 10X 10440Cxi	3,329.99
Satellite Pro 460Cxi, 166MHz Pentium® MMX™, 12.1" DSTN, 32MB RAM, 2.1GB HDD, 10X 10460Cxi	4,199.99
Portégé 300Cxi, 133MHz Pentium® MMX™, 10.4" TFT, 16MB RAM, 1.26GB HDD, 10X 10300Cxi	3,549.99
Portégé 660Cxi, 150MHz Pentium®, 11.3" TFT, 16MB RAM, 1.35GB HDD, 10X 10660Cxi	4,299.99
Portégé 650Cxi, 133MHz Pentium®, 11.3" TFT, 16MB RAM, 1.26GB HDD, 10X 10650Cxi	2,999.99
Tecra 500Cxi, 120MHz Pentium®, 12.1" TFT, 16MB RAM, 1.26GB HDD, 6X 10500Cxi	2,399.99
Tecra 510Cxi, 133MHz Pentium®, 12.1" TFT, 16MB RAM, 2.1GB HDD, 10X 10510Cxi	2,949.99
Tecra 520Cxi, 166MHz Pentium® MMX™, 12.1" TFT, 32MB RAM, 2.0GB HDD, 10X 10520Cxi	4,589.99
Tecra 530Cxi, 166MHz Pentium® MMX™, 12.1" TFT, 32MB RAM, 2.0GB HDD, 10X 10530Cxi	4,999.99
Tecra 730Cxi, 150MHz Pentium® MMX™, 12.1" TFT, 16MB RAM, 2.0GB HDD, 10X 10730Cxi	4,299.99
Tecra 740Cxi, 166MHz Pentium® MMX™, 13.3" TFT, 16MB RAM, 2.0GB HDD, 10X 10740Cxi	5,799.99
Tecra 740Cxi, 166MHz Pentium® MMX™, 13.3" TFT, 16MB RAM, 3.0GB HDD, 10X 10740Cxi	6,199.99
Tecra 740Cxi, 166MHz Pentium® MMX™, 13.3" TFT, 16MB RAM, 3.0GB HDD, 10X 10740Cxi	6,449.99

IBM

ThinkPad 365X, 133MHz Pentium®, 11.3" DSTN, 8MB RAM, 1.08GB HDD 107265259	\$1,099.99
ThinkPad 380, 150MHz Pentium®, 12.1" DSTN, 16MB RAM, 1.08GB HDD, 8X 107263510	1,779.99
ThinkPad 3000, 150MHz Pentium® MMX™, 12.1" DSTN, 16MB RAM, 1.35GB HDD, 8X 107263520	2,069.99
ThinkPad 3800, 150MHz Pentium® MMX™, 12.1" TFT, 16MB RAM, 2.1GB HDD, 8X 107263530	2,999.99
ThinkPad 560, 133MHz Pentium®, 11.3" DSTN, 8MB RAM, 2.1GB HDD 107264010	1,979.99
ThinkPad 560, 133MHz Pentium®, 12.1" TFT, 8MB RAM, 2.1GB HDD 107264020	3,799.99
ThinkPad 560E, 150MHz Pentium®, 12.1" TFT, 16MB RAM, 2.1GB HDD 107264030	2,699.99
ThinkPad 560E, 166MHz Pentium® MMX™, 12.1" TFT, 16MB RAM, 2.1GB HDD 107264040	4,299.99
ThinkPad 760E, 133MHz Pentium®, 12.1" TFT, 16MB RAM, 2.1GB HDD, 6X 107540090	3,699.99
ThinkPad 760E, 150MHz Pentium®, 12.1" TFT, 16MB RAM, 2.1GB HDD 107540090	3,699.99
ThinkPad 760X, 166MHz Pentium® MMX™, 12.1" TFT, 32MB RAM, 3.0GB HDD, 8X 107540090	5,149.99
ThinkPad 760XL, 166MHz Pentium®, 12.1" TFT, 16MB RAM, 2.1GB HDD 107540090	4,199.99
ThinkPad 760XL(NT), 166MHz Pentium®, 12.1" TFT, 32MB RAM, 2.1GB HDD 107540090	4,399.99
ThinkPad 765L, 166MHz Pentium® MMX™, 13.3" TFT, 32MB RAM, 3.0GB HDD 107540090	6,329.99
ThinkPad 765D, 166MHz Pentium® MMX™, 12.1" TFT, 32MB RAM, 3.0GB HDD 107540090	6,999.99

Compaq

Armada 15100M, 120MHz Pentium®, 11.3" DSTN, 16MB RAM, 1.08GB HDD, 10X 255250-003	\$1,839.99
Armada 15200M, 133MHz Pentium®, 11.3" DSTN, 16MB RAM, 1.08GB HDD, 10X 255050-003	2,049.99
Armada 15500M, 133MHz Pentium®, 12.1" TFT, 16MB RAM, 1.4GB HDD, 10X 255150-003	3,199.99
Armada 7710MT, 150MHz Pentium® MMX™, 12.1" TFT, 16MB RAM, 1.6GB HDD 270702-002	4,399.99
Armada 7730MT, 166MHz Pentium® MMX™, 12.1" TFT, 32MB RAM, 2.1GB HDD 277704-003	4,999.99
Armada 7750MT, 166MHz Pentium® MMX™, 12.1" TFT, 32MB RAM, 2.1GB HDD 220004-003	5,799.99

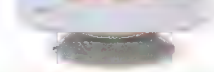
ETHERNET ADAPTERS & PRINT SERVERS

3Com

Fast Ethernet XL, TP, PCI 10/100/1000	\$95.99
EtherLink III, ISA, 10Base-T (10Base-T, RJ-45 only) 10/100/1000	59.99
EtherLink III, ISA, 10Base-T/PC (10Base-T, BNC, RJ-45) 10/100/1000	69.99
EtherLink III LAN+33.6 F/M, PCMCIA 10/100/1000	299.99
EtherLink III, TP, PCMCIA 10/100/1000	129.99
EtherLink III, TP/BNC, PCMCIA 10/100/1000	189.99

Intel

EtherExpress PRO/10+, TP, ISA 10/100/1000	\$72.99
EtherExpress PRO/10+, TP, PCI 10/100/1000	83.99
EtherExpress PRO/100, TP, PCI 10/100/1000	79.99
EtherExpress PRO/100, PCMCIA 10/100/1000	159.99
NetExpress PRO/100, 9 ports 10/100/1000	379.99
NetExpress PRO/100, 1 port 10/100/1000	269.99



\$558.99
MV604200

DJ702E 17" Monitor

- 17"/16.1" screen/viewable size
- Microfilter™ FST with anti-glare, anti-static coating
- 26mm dot pitch; 1024 x 768 @75Hz
- JAG™ On-Screen display

In Touch with Tomorrow TOSHIBA



\$2969.99
TAS10C0T

Tecra 510Cxi Notebook

- 133MHz Pentium® processor with 256K L2 cache
- 12.1" active matrix display
- 16MB EDO DRAM
- 2.1GB hard drive; 10X CD-ROM

SONY pc by sony



\$2149.99
SOPCV130

PCV-130 System

- 200MHz Pentium® processor with MMX™ technology
- 32MB SD-RAM; 4MB EDO video/3D
- 4.3GB hard drive; 24X CD-ROM
- 100MB Internal Zip Drive
- 33.6 DSVD modem

CIRCLE 278 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

Prices and availability are subject to change without notice. All trademarks and registered trademarks are the property of their respective owners. The Intel Inside logo, Pentium, Celeron, and MMX are trademarks or registered trademarks of Intel Corporation. Prices may not represent actual product. Typographic errors are subject to correction. All products carry full manufacturer's warranty. If any manufacturer's warranty or other restriction, liability, or limitation of remedy is stated on the product, it shall apply to the product. No other warranty, limitation of remedy, or restriction of liability shall apply. Product may be returned to Insight for a full credit, excluding shipping charges, within 30 days of purchase. Return of product is subject to a 15% restocking fee. Returns of unopened computers, monitors, speakers, and printers will be charged a 15% restocking fee and must be received by Insight within 15 days of purchase. All returns must be in as-shipped condition and require an RMA number. Packages without an RMA will not be accepted. Sorry, no refunds can be made after 30 days, all sales are final. Shipping is not included. Return address: Insight PC/Mag Dept., 10000 N. Central Ex., Suite 100, Dallas, TX 75243. (972) 419-1000. © 1999 Insight Direct, Inc.

For faster service mention this key code when placing your order: **MAC3**

800-INSIGHT
467-4448
www.insight.com

REPLACE YOUR HARD DRIVE, NOT YOUR NOTEBOOK.

INFINITY FEATURES

High Capacity

Available in sizes ranging from 1.44 to 3.08 GB

Removable

Plug and Play design.

Easy Installation

Includes EZ-Drive software from Micro House for easy, one-step installation.

Performance

Fast 16.6 megabytes per second average transfer rate.

Warranty

Backed by a 3 year warranty and lifetime toll-free technical support.

Compatibility

With DOS, Windows, Windows 95, Windows NT, and OS/2 Warp.

Quality

Solutions designed for use with IBM systems covered by your IBM on-site warranty.

Selection

Designed for use in the industry's most popular portable computers.

Reliability

300,000 hours MTF and self diagnostic capability.

Transportability

Take all your large files on the road.

Paragon Memory

pm_sales@paragonmem.com
pm_tech@paragonmem.com
www.paragonmem.com
Phone: 714-643-8844
Fax: 714-643-8855



Infinity Storage Solutions from Paragon provide you with a removable replacement hard drive designed and engineered specifically for your portable computer allowing you to increase your storage capacity to as much as 3 gigabytes! Infinity Storage Solutions replace your notebook's internal hard disk so there are no external devices, disks, or power supplies to transport.

Infinity Storage Solutions are backed by a 3 year warranty and guaranteed compatible with all supported models. Paragon also provides toll-free technical support for the lifetime of your Infinity storage product. In addition, Infinity Storage Solutions designed for use with IBM ThinkPad models are also covered by your IBM on-site warranty.



Upgrade to Excellence

To Locate A
Dealer Near You,
Call Paragon.
[800] 643-8866

System Model to be Upgraded ... 1.44GB 2.16GB 3.08GB

	INFINITY P/N	INFINITY P/N	INFINITY P/N
AST			
ASCENTIA 800, 900, 910, 950	PMS-ADA02014	PMS-ADA02021	PMS-ADA01030
POWEREDGE, PREMIUM EXEC SERIES	PMS-ADA02014	PMS-ADA02021	PMS-ADA01030
COMPAQ			
LITE 5000, LITE ELITE SERIES	PCQ-EL02014	PCQ-EL02021	PCQ-EL02030
CONTURA AERO	PCQ-ADA02014	PCQ-ADA02021	PCQ-ADA02030
CONTURA 425, 430, 410, 400, 325	PCQ-ADA02014	PCQ-ADA02021	PCQ-ADA02030
ARMADA 1100, 4100 FAMILIES	PCQ-ADA02014	PCQ-ADA02021	PCQ-ADA02030
DELL			
DELL LATITUDE 82, 90, 100, 100	PBL-LAB02014	PBL-LAB02021	PBL-LAB01030
IBM			
THINKPAD 760 SERIES	PMB-TP03014	PMB-TP03021	PMB-TP03030
THINKPAD 701 SERIES	PMB-TP02014	PMB-TP02021	PMB-TP02030
THINKPAD 755, 750, 360, 355	PMB-TP01014	PMB-TP01021	PMB-TP01030
THINKPAD 560, 365, 350	PMB-ADA02014	PMB-ADA02021	PMB-ADA02030
NEC			
VERSA 3000, 4000, 4000 SERIES	PNC-VS02014	PNC-VS02021	PNC-VS02030
VERSA 2400, 2500 SERIES	PNC-ADA02014	PNC-ADA02021	PNC-ADA02030
VERSA E, M, R V	PNC-VS01014	PNC-VS01021	PNC-VS01030
TOSHIBA			
TECRA 500, 510	PYS-TS02014	PYS-TS02021	PYS-TS02030
TECRA 700, 710, 730, 730, 740	PYS-TS01014	PYS-TS01021	PYS-TS01030
SATELLITE 14700, 14800, 14850	PYS-TS01014	PYS-TS01021	PYS-TS01030
SATELLITE 14900, 14950, 15000	PYS-TS01014	PYS-TS01021	PYS-TS01030
12330, 12310, 12300	PYS-TS01014	PYS-TS01021	PYS-TS01030
PORTEGE 610, 13600, 13400	PYS-TS01014	PYS-TS01021	PYS-TS01030
SATELLITE PRO 400, 410, 420, 430, 200, 110, 12355, 12350	PYS-TS01014	PYS-TS01021	PYS-TS01030



800-897-1317
www.elekttek.com



800-555-6255
www.pcmall.com



800-888-4437
www.tigerdirect.com



800-258-2088
www.pczone.com



800-367-7080
www.microwarehouse.com

To Order, Contact One Of These Paragon Authorized Resellers.
*Suggested retail price. ©1997 Paragon Memory Corporation. All specifications subject to change without notice. Infinity is a trademark of Paragon Memory Corporation. Trademarks and registered trademarks are properties of their respective companies.

CELEBRATE AS PCs COMPLEAT JOINS THE NEW COMPUSA DIRECT.



COMPUSA
DIRECT

Superstore Savings Direct To You™

1-800-256-9238

www.compusa.com

**FREE
OFFERS
INSIDE!**

GRAND OPENING FREE

CALL WHILE SUPPLIES LAST.

THE NEW COMPUSA DIRECT

Advantage!

The service and experience of PCs Complete combined with the selection, support and incredible buying power of CompUSA Direct. We offer over 130 store locations nationwide for: hassle-free drop-off technical service, product returns and exchanges.

- ✓ Over 50,000 products
- ✓ Knowledgeable, helpful service
- ✓ Guaranteed low pricing
- ✓ Same day shipping for second day delivery
- ✓ Professional on-site installation available
- ✓ Custom configuration
- ✓ Free software installation with system purchase
- ✓ Toll-free technical support for hardware and software
- ✓ Hassle-free drop-off technical service at over 130 CompUSA superstores nationwide
- ✓ On-site technical service available
- ✓ Technology Assurance Program's support/repair coverage
- ✓ Computer and software training at CompUSA training facilities
- ✓ No payment, no interest for six months
- ✓ Flexible payment plans
- ✓ Money-back satisfaction guaranteed

FREE VCR & SCANNER

Purchase a desktop computer containing a 166MHz or greater processor and get a FREE VCR and scanner!

A \$339 Value! Limit 2 per customer.
Product may differ slightly from photo.

or **VISIONEER**

FREE SCANNER

Purchase any desktop computer and get a FREE PC Compatible Scanner!

A \$199 Value!
Limit 2 per customer



FREE VCR & CARRYING CASE

Purchase any notebook computer containing a 166MHz or greater processor and get a FREE VCR and carrying case!

A \$230 Value!
Limit 2 per customer.

or

FREE CARRYING CASE

Purchase any notebook computer and get a FREE carrying case to help protect your investment! A \$90 Value!

Limit 2 per customer.



FREE

Broderbund®

PrintShop Deluxe III!

Purchase any Canon, Epson, NEC or Okidata printer and get PrintShop Deluxe III FREE! Limit 2 per customer



FREE

Robotics

Palm Pilot!

Purchase any Fujitsu 500 or 600 series LifeBook notebook computer and get a FREE Palm Pilot! A \$199 Value! Limit 2 per customer.

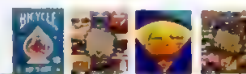


FREE

Solitaire, Trivial Pursuit or Atari Action 2 and 3!

Receive one of the following titles FREE with the purchase of \$50 or more in software!

Limit 2 per customer.



FREE

MEMOREX 3.5" Diskettes

with Case!

40-pack of preformatted diskettes and case! A \$20 Value!

Limit 2 per customer.

*Free after Manufacturer Mail-In Rebate.



20⁰⁰
-20⁰⁰
0⁰⁰

FREE

MOUSE SYSTEMS

3-Button Mouse!

PS/2 3-Button Mouse! A \$10 Value! Limit 2 per customer. *Free after Manufacturer Mail-In Rebate.



Price Before Rebate 10⁰⁰
-10⁰⁰
0⁰⁰
Price After Rebate

FREE



EarthLink Internet Access!

Purchase any desktop or notebook computer and get an EarthLink FREE for 30 days! A \$45 Value!

THE NEW COMPUSA DIRECT

Superstore Savings Direct To You.

1-800-256-9238

www.compusa.com

OFFERS AVAILABLE THROUGH MAIL ORDER AND THE INTERNET ONLY.

OFFERS & REBATES!

LIMITED TIME OFFERS!

OFFERS
AVAILABLE
THROUGH MAIL
ORDER AND
INTERNET
ONLY.



**FREE
CARRYING CASE
WITH ANY
NOTEBOOK
PURCHASE!**

**\$200 OFF
ANY TOSHIBA
NOTEBOOK**



TOSHIBA

Satellite 220 CDS

- 133MHz Pentium® Processor
- 1.4GB Hard Drive
- 16MB RAM
- 10X CD-ROM Drive
- 12.1" Dual-Scan Color Display

(Some software is preloaded. Software manuals/diskettes not included.)

Price Before Rebate
1999⁹⁵
Instant Rebate
-200⁰⁰
1799⁹⁵
Price After Rebate
While supplies last
PA1240US2C

**YOUR
CHOICE
\$300
INSTANT
REBATES**

**LIMITED
TIME
OFFER!**



Packard Bell. E154

- 150MHz Pentium® Processor • 2.0GB Hard Drive
- 32MB EDO RAM • 14X CD-ROM Drive •
- 33.6/14.4 Data/Fax Modem • 3D Amphitheater Sound

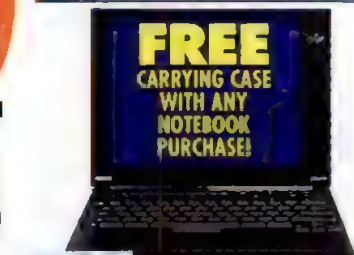


**FREE
SCANNER WITH
PURCHASE!**



**FREE
VCR AND
SCANNER WITH
PURCHASE!**

(Some software is preloaded. Software manuals/diskettes not included.)
Price Before Rebate
1199⁹⁵
Instant Rebate
-300⁰⁰
899⁹⁵
Price After Rebate
While supplies last 842948



- 100MHz Pentium® Processor • 8MB RAM • 810MB Hard Drive Plus CD • 11.3" Dual-Scan Color Display



Price Before Rebate
1299⁹⁵
Instant Rebate
-300⁰⁰
999⁹⁵
Price After Rebate
While supplies last
264050A

**\$200
INSTANT
REBATE**



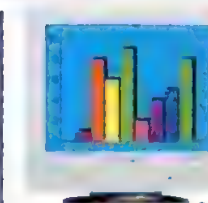
Pavilion 726

- 200MHz Pentium® Processor
- 3 1GB EIDE Hard Drive • 32MB RAM • 28.8/14.4 Data/Fax Modem • 8X MAX CD-ROM Drive • With Speakerphone and Answering System • Stereo Sound with Waveable and Altec Lansing Speakers

(Some software is preloaded. Software manuals/diskettes not included.)



Price Before Rebate
1299⁹⁵
Instant Rebate
-200⁰⁰
1099⁹⁵
Price After Rebate
Monitor sold separately
While supplies last
D3903A#ABA888



- 17" Color Monitor, 28 NI, 15.8" Viewable Image Size, 1280x1064 at 60Hz

**\$100
INSTANT
REBATES**

Price Before Rebate
499⁹⁵
Instant Rebate
-100⁰⁰
399⁹⁵
Price After Rebate
VS-7



**FREE
VCR AND
SCANNER WITH
PURCHASE!**

- 166MHz Pentium® Processor • 3 2GB Hard Drive • 16MB RAM • 8X CD-ROM Drive • 28.8/14.4 Data/Fax Modem

(Some software is preloaded. Software manuals/diskettes not included.)



Price Before Rebate
1199⁹⁵
Instant Rebate
-100⁰⁰
1099⁹⁵
Price After Rebate
Monitor sold separately
2159566-RE-8

**\$50
INSTANT
REBATES**

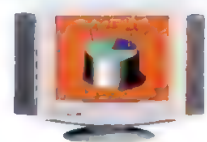


MICROTEK

Black and White Page Scanner

For business and home. Scans business cards, memos, magazine articles and other documents at 300dpi.

Price Before Rebate
99⁹⁵
Instant Rebate
-50⁰⁰
49⁹⁵
Price After Rebate
1108-90-300010



Packard Bell.

14" Color Remanufactured Multimedia Monitor

- 13.1" Viewable Image Size
- 1024x768 Resolution
- 28 NI
- Integrated Stereo Speakers

Price Before Rebate
199⁹⁵
Instant Rebate
-50⁰⁰
149⁹⁵
Price After Rebate
018277-FR



EPSON

StylusPro Inkjet Remanufactured Printer

- 720x720dpi Resolution
- 4ppm
- 64KB Cache Buffer

Price Before Rebate
249⁹⁵
Instant Rebate
-50⁰⁰
199⁹⁵
Price After Rebate
C164001-FR

**THE NEW
COMPUSA
DIRECT**

GET THE COMPUSA ADVANTAGE WITH
OVER 130 STORES NATIONWIDE FOR
TECHNICAL SUPPORT AND SERVICES!

1-800-256-9238
www.compusa.com

FREE VCR WITH ANY P166 OR LARGER COMPUTER!

PLUS \$200 OFF ANY TOSHIBA NOTEBOOK COMPUTER!



FREE
EarthLink
Internet Access!
Purchase any
desktop or
notebook
computer and get EarthLink
FREE for 30 days! A \$45⁰⁰ Value!



Satellite 440CDX

SAVE \$200!

(Some software is preloaded. Software manuals, diskettes not included.)

TOSHIBA

Satellite 440CDX with
MMX™ Technology

- 133MHz Pentium® Processor • 1.4GB Hard Drive • 16MB RAM • 10X CD-ROM Drive • 12.1" FastScan High Contrast Color Display

Price Before Rebate

2499⁹⁵

Instant Rebate -200⁰⁰*

2299⁹⁵

Price After Rebate

PA1241U-H2C

*Remanufactured and demos excluded

Toshiba 220CD	Pentium® 133, 12.1" Dual Scan, 16MB 1.4GB 10X CD-ROM	PA1240U-52C	1999 95 2000R-1799 95
Toshiba 440CI	Pentium® 133MMX™ 12.1" Active 16MB 1.4GB 10X CD-ROM	PA1241U-12C	3299 95 2000R-3099 95
Toshiba 520CDI	Pentium® 166MMX™ 12.1" Active 32MB 2GB 10X CD-ROM	PA1246U-12A	4699 95 2000R-4499 95
Toshiba 530CDI	Pentium® 166MMX™ 12.1" Active 32MB 2.1GB 10X CD-ROM	PA1247U-12A	5099 95 2000R-4899 95



HITACHI

VisionBook Elite 8560

- 166MHz Pentium® Processor with MMX™ Technology • 16MB RAM • 13.3" TFT Active Matrix Display • 2.1GB Hard Drive • 10X CD-ROM

(Some software is preloaded. Software manuals, diskettes not included.)

ONLY
4799⁹⁵
8560-001



FUJITSU

PORTABLE PC CORPORATION

LifeBook 6331

- 133MHz Pentium® Processor • 1.3GB Hard Drive • 16MB RAM • 8X CD-ROM Drive • 12.1" Active Matrix Color Display

(Some software is preloaded. Software manuals, diskettes not included.)

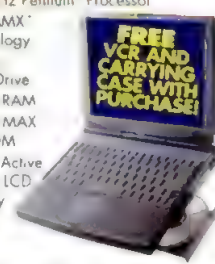


2999⁹⁵
Price Break -500⁰⁰
2499⁹⁵
FPC030022

SONY

PCG-707C

- 166MHz Pentium® Processor with MMX™ Technology • 2.1GB Hard Drive • 32MB RAM • 14.5X MAX CD-ROM • 12.1" Active Matrix LCD Display



(Some software is preloaded. Software manuals, diskettes not included.)

ONLY
4499⁹⁵
PCG 707C

Sony PCG-705C Pentium® 150MMX™ 12.1" Active Matrix Display 16MB 2.1GB PCG-705C 3499.95

FREE SCANNER WITH THE PURCHASE OF ANY DESKTOP COMPUTER!

COMPAQ

Presario 7170 Remanufactured

- 90MHz Pentium® Processor • 840MB Hard Drive • 8MB RAM/128 MB Max • 4X CD-ROM Drive • 14.4 Data/Fax Modem

(Some software is preloaded. Software manuals, diskettes not included.)

Monitor Sold Separately While Supplies Last



Price Before Rebate 699⁹⁵
Instant Rebate -100⁰⁰
599⁹⁵
Price After Rebate 8560-001



AST

Bravo LC Desktop Computer

- 133MHz Pentium® Processor • 2.0GB Hard Drive • 16MB RAM • 128 MB Max • 5 Slots/5 Bays

(Some software is preloaded. Software manuals, diskettes not included.)

Monitor Sold Separately While Supplies Last



Price Before Rebate 899⁹⁵
Instant Rebate -100⁰⁰
799⁹⁵
Price After Rebate 501959 501

COMPAQ

Presario 4504

- 200MHz Pentium® Processor • 2.1GB Hard Drive • 16MB RAM • 16X CD ROM Drive • 16 Bit Graphics with Direct 3-D

(Some software is preloaded. Software manuals, diskettes not included.)

Monitor Sold Separately While Supplies Last



ONLY
999⁹⁵
304300-003
Monitor Sold Separately While Supplies Last

Packard Bell

D1000

- 133MHz Pentium® Processor • 1.2GB Hard Drive • 16MB EDO RAM • 8X CD-ROM Drive



(Some software is preloaded. Software manuals, diskettes not included.)
Monitor Sold Separately While Supplies Last



Price Before Rebate 899⁹⁵
Instant Rebate -100⁰⁰
799⁹⁵
Price After Rebate 845020

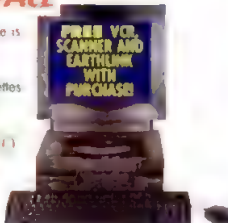
COMPAQ

Presario 2200

- 166MHz Pentium® Processor • 1.6GB Hard Drive • 16MB RAM • 8X CD-ROM Drive

(Some software is preloaded. Software manuals, diskettes not included.)
Monitor Sold Separately While Supplies Last

Presario 2200 with 14" Monitor 292600-004 KIT 999 95
14" CRT Monitor 13.2" Viewable Image Size 285706-001 229 95



COMPAQ

DeskPro 2000

- 133MHz Pentium® Processor • 1.2GB Hard Drive • 16MB RAM

(Some software is preloaded. Software manuals, diskettes not included.)
Monitor Sold Separately While Supplies Last

999⁹⁵
Price Break -100⁰⁰
899⁹⁵
243900-003



Venturis FX-2

- 166MHz AMD K5 Processor with MMX™ Technology • 16MB RAM • 256 MB Max • 1.2GB Hard Drive

(Some software is preloaded. Software manuals, diskettes not included.)

Monitor Sold Separately While Supplies Last



ONLY
999⁹⁵
FRDAA07 AA

1-800-256-9238
www.compUSA.com

GET THE COMPUSA ADVANTAGE WITH
OVER 130 STORES NATIONWIDE FOR
TECHNICAL SUPPORT AND SERVICE.

THE NEW
COMPUSA
DIRECT

GRAND OPENING VALUES!

OFFERS AVAILABLE THROUGH MAIL ORDER AND THE INTERNET
ONLY FOR A LIMITED TIME!

Maxtor

2.0GB IDE Hard Drive

- 256k Cache Buffer
- Less Than 11ms Average Access Time
- 16.7mb/sec Data Transfer Rate



K0172000A

Available through mail order and internet only.

Price Before Rebate

199⁹⁵

Mail-In Rebate -30⁰⁰

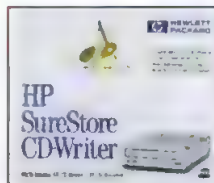
169⁹⁵

Price After Rebate

HEWLETT PACKARD

Recordable CD-ROM

- 6x2 Read/Write
- Internal Parallel
- 74 Minute Discs



C 4344A#ABA

FREE!

REMARKS ON RECORDABLE CD-ATRE MAIL-IN REBATE

499⁹⁵

Price Before Rebate -120⁰⁰

379⁹⁵

MEMORY BLOWOUT!

8MB SIMM Memory Upgrade

2x32, 72pin Non-Parity

39⁹⁵
2X32

16MB SIMM Memory Upgrade

4x32, 72pin Non-Parity

59⁹⁵
4X32

32MB SIMM Memory Upgrade

8x32, 72pin Non-Parity

139⁹⁵
8X32



Kodak
digital scanner
SOLUTIONS

Digital Camera DC-25

- Focus-free Lens
- Automatic Flash
- Built-In LCD Color Display
- Resolution: 493x373 dpi



8798746

399⁹⁵

Mail-In Rebate -100⁰⁰

299⁹⁵

SAVE 100⁰⁰

ON ANY DIGITAL VIDEO CAMERA WITH A 100% PHOTOGRAPHIC IMAGE DO-IT, DO-BE DO-IT-DO-IT DIGITAL CAMERA

EPSON

STYLUS 500 Remanufactured Inkjet Printer

- 720x720dpi Black and Color with Special Paper
- Up to 4ppm Black at 360x360dpi
- 1ppm Color at 360x360dpi



C198011-FR

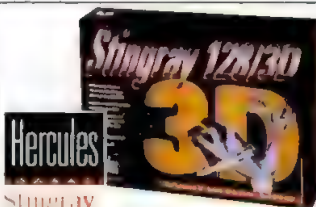
Price Before Rebate

199⁹⁵

Mail-In Rebate -50⁰⁰

149⁹⁵

Price After Rebate



Hercules Stingray Graphics Card

- 128-Bit High-Performance
- 6MB EDO DRAM
- 3D Game Included

249⁹⁵

S3316

KAO 3.5" DS/HD Diskettes, 50-Pack

- IBM-Preformatted



Price Before Rebate

15⁰⁰

Mail-In Rebate -15⁰⁰

0⁰⁰

Price After Rebate

1000012350

Portable 8X CD-ROM Drive

- Includes PC Card Interface and AC-Adapter
- Sound Blaster Compatible
- 1200KB Transfer Rate
- 1-Year Warranty Shipped in promotional packaging



Price Before Rebate

339⁹⁵

Mail-In Rebate -50⁰⁰

289⁹⁵

Price After Rebate

Connectix

Color QuickCam 2

- 640x480 Pixel Resolution
- Range 1" to Infinity
- Optimized for Indoor Lighting
- Includes CUSEEME Software



CUSMW511

Price Before Rebate

299⁹⁵

Mail-In Rebate -50⁰⁰

Instant Rebate -15⁰⁰

234⁹⁵

Price After Rebate

PLAY
Interactive

Video Capture Adapter

- Make your own videos
- Keep photos safe
- Easy connection to your VCR



199⁹⁵

9992-075

SPOT
The Smart Power of Technology

Color Scanner

- 300x300 dpi
- 24-Bit Color
- 8-Bit Grayscale

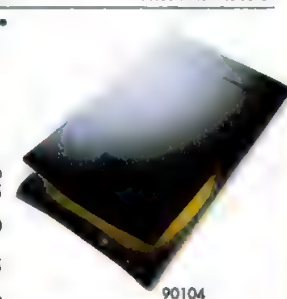
Price Before Rebate

149⁹⁵

Mail-In Rebate -50⁰⁰

99⁹⁵

Price After Rebate



90104

We'll beat any legitimate price in the current issue of this magazine on every product we sell. CompUSA Direct prices are available through mail order and are valid until the next issue of this magazine, or 30 days from the date of this issue, whichever comes first. Our low price guarantee pertains to new, factory sealed products of the same brand and model number that are available and in stock at any local authorized retail store. Our guarantee does not apply to competitors' one-of-a-kind or other limited-quantity offers, special financing, installation, manufacturer's rebate, or when a bonus or free offer is included in the purchase. Some restrictions apply. Prices and specifications are subject to change without notice. We reserve the right to limit quantities. All Hayes modems, laser printers and some other printers, monitors and laptops must be sent to authorized service centers. Any typographical, photographic, or production error in products, pricing or offers is subject to correction. Due to manufacturers' restrictions, certain products may not be eligible for international shipment, and certain products may not be available via mail order. Please call for details. Monitor displays are simulated. Pentium, the Intel Inside and Pentium Processor logos are registered trademarks and MMX is a trademark of the Intel Corporation. Windows is a registered trademark of Microsoft in the U.S. and other countries. Packard Bell is a registered trademark of Packard Bell Electronics, Inc. IBM is a registered trademark and Aptiva and Total Image Video are trademarks of International Business Machines Corporation, used under license therefrom. All other trademarks are the property of their respective companies. Items, other than software, returned within ten (10) days from the date of purchase with the original receipt or invoice are eligible for refund or exchange. Unopened software may be returned within thirty (30) days for refund or exchange. Opened software may be returned for exchange only within ten (10) days from the date of purchase. A restocking will be charged on all returned items with missing boxes or packaging and returned printers with installed toner or inkjet cartridges. Refunds on purchases made with a credit card will only be credited to the same card. In Connecticut only, instant rather than mail-in rebate. Superstore Savings Direct To You, CompPrice, The Low Price Period and America's Largest Computer Superstore are service marks of CompUSA Management Company. CompUSA and CompUSA Direct are registered trademarks of CompUSA Management Company. ©1997 CompUSA Management Company.

1-800-256-9238
www.compusa.com

INTERNATIONAL: 508-786-0600
OPEN 7AM-MIDNIGHT WEEKDAYS. 8AM-MIDNIGHT
WEEKENDS AND HOLIDAYS.

THE NEW
COMPUSA
DIRECT



USA FLEX

The Best Prices on Over 20,000 Computer Products

Toshiba Satellite 220CDS

- 133MHz Pentium® Processor
- 16MB RAM
- 1.44GB HDD
- 10X CD-ROM
- 12.1" SVGA DSTN Color Display

Only \$1949
CP5166

HP LaserJet 6Lse Printer

NEW!

- 6ppm
- 600dpi black laser printing

\$399⁹⁵
PR12310

US Robotics x2™ 56K Modem

Internal Model BND2130 **\$147⁹⁹**
External Model BND2131 **\$167⁹⁹**
*Price reflects mfr's \$50 rebate. Expires 10/4/97

Microsoft Office 97 Standard

Includes the following titles: Excel '97, Word '97, PowerPoint '97, and Outlook '97.

\$179⁹⁵
Office 97

*Price reflects Microsoft \$40 version upgrade rebate. Price before rebate is \$219.95. \$244.2

Imagema Zip Drive

Only **\$149⁹⁵**

- Small, light and portable
- Store 100MB on each 3.5" disk

ORA602 Parallel DR1050 SCSI BR2200 Inside

MONITORS/GRAPHICS CARDS	
14"	
Power User MT0828	\$199⁹⁵
Viewsonic Optquest V641 MT1403	\$209⁹⁵
PRINCETON E640 MT1511	\$219⁹⁵
Philips/Magnavox MB4010 MT1519	\$239⁹⁵
15"	
PRINCETON E650 MT1516	\$289⁹⁵
Viewsonic Optquest V655 MT1404	\$299⁹⁵
Viewsonic G655 MT1411	\$319⁹⁵
Passionate S15 MT1518	\$329⁹⁵
MAG DX157 TRINITRON MT1558	\$359⁹⁵
NEC E500 MT1547	\$389⁹⁵
17"	
Power User MT1178	\$469⁹⁵
PRINCETON E670 MT1514	\$499⁹⁵
Viewsonic G771 MT1517	\$509⁹⁵
Passionate S17 MT1520	\$519⁹⁵
MAG DX700 MT0612	\$579⁹⁵

HERCULES	
T2312EDO Terminator 3D PCI, 2MB	\$99⁹⁵
T2314EDO Terminator 3D PCI, 4MB	\$129⁹⁵
T2212EDO Terminator 64 PCI, 2MB	\$79⁹⁵
PLAY	
Sonny Video Capture	\$89⁹⁵
ATI	
Video Xpression+ 2MB	\$99⁹⁵
3D Xpression+ PC2TV, 2MB	\$139⁹⁵
3D Pro Turbo PC2TV, 4MB	\$169⁹⁵
GPROTURBOPCI4 3D Pro	\$299⁹⁵
Turbo PC2TV RMB	\$299⁹⁵
CREATIVE LABS	
GBMA202 Graphics Blaster MA202	\$49⁹⁵
GBMA302 Graphics Blaster MA302	\$79⁹⁵
GBMA334 Graphics Blaster MA334	\$99⁹⁵

MEGAHERTZ	
56K x2 with Xjack DMD2771	\$239⁹⁵
33.6 with Xjack, Cellular capable DMD2304	\$229⁹⁵
33.6 Modem (10Base-T with Xjack) DMD2310	\$269⁹⁵
10Base-T with Xjack (10/100T) DMD2363	\$109⁹⁵
10Base-T (ex 10 BT) DMD2357	\$109⁹⁵
HAYES PC CARD	
Optima 33.6 Fax Modem w/EZ Jack	\$189⁹⁵
HA-0260 DMD2519	\$189⁹⁵
PRACTICAL PERIPHERALS	
V56K PC-Card, K56flex DMD2473	\$199⁹⁵
33.6 PC-Card EZ-Jack DMD2157	\$135⁹⁵

PC CARDS	
BOCA	
Boca M56 (External) K56flex DMD2472	\$165⁹⁵
Boca M56 (Internal) K56flex DMD2471	\$145⁹⁵
HAYES	
Accura 33.6 External DMD2440	\$119⁹⁵
Hayes 56K K56flex External DMD2526	\$169⁹⁵
Hayes 56K K56flex Internal DMD2525	\$139⁹⁵
US ROBOTICS	
Sportster 33.6 External DMD2138	\$89⁹⁵
Sportster 33.6 External DMD2139	\$119⁹⁵
Sportster 56K External DMD2130	\$147⁹⁵
Sportster x2 56K External DMD2131	\$167⁹⁵
Courier V. Everything Internal DMD1649	\$229⁹⁵
Courier V. Everything External DMD1650	\$249⁹⁵

CREATIVE LABS	
Sound Blaster AWE64/2400	\$279⁹⁵
EX7607	\$279⁹⁵
Sound Blaster AWE64 Gold	\$199⁹⁵
EX7684	\$199⁹⁵
Sound Blaster AWE64 value EX7814	\$99⁹⁵
Sound Blaster 16 Basic EX7961	\$69⁹⁵
Creative PC-DVD DR6307	\$499⁹⁵
PINNACLE MICRO	
4X4 CD-Writer Internal DR5513	\$739
4X4 CD-Writer External DR5512	\$839

MULTIMEDIA/CD-ROM	
PANASONIC	
Portable 4X CD-ROM Drive DR4853	\$299⁹⁵
Portable 4X CD-ROM Drive with Speakers DR4940	\$399⁹⁵
Portable 8X CD-ROM Drive DR5651	\$399⁹⁵
24X CD-ROM Atapi EIDE Drive DR6620	\$179⁹⁵
24X CD-ROM SCSI Drive DR6619	\$219⁹⁵
PHILIPS	
2X/6X CD-EasyWriter Internal DR5746	\$499

PRINTERS...LASER/INK JET/DOT MATRIX	
HP PRINTERS	
Deskjet 340 PR11412	\$299⁹⁵
Deskjet 672C PR12302	\$299⁹⁵
Deskjet 694C PR12125	\$299⁹⁵
Deskjet 820C PR11480	\$299⁹⁵
Deskjet 870C PR11792	\$399⁹⁵
Deskjet 1600C PR11386	\$1349⁹⁵
Laserjet 5se PR12310	\$1049⁹⁵
Laserjet 6L PR12316	\$399⁹⁵
Laserjet 6P PR12301	\$799⁹⁵
Laserjet 6MP PR10975	\$999⁹⁵
Officejet 570 color 4-in-1 PR12303	\$599⁹⁵

OKIDATA PRINTERS	
OkiPage 4W (Windows Only) PR11702	\$199⁹⁵
O6000 PR11418	\$299⁹⁵
ML321 Turbo PR11771	\$319⁹⁵
ML320 Turbo PR11772	\$459⁹⁵
ML590 PR11302	\$439⁹⁵
ML591 PR11303	\$589⁹⁵
CANON	
RJC-240 PR11764	\$169⁹⁵
RJC-4200 PR11763	\$199⁹⁵
RJC-4550 (up to 11x17") PR11766	\$499⁹⁵
RJC-620 PR11765	\$329⁹⁵
C2500 (Fax, Scan, Print, Copy) PR11712	\$499⁹⁵

DESKTOP SYSTEMS	
IBM 300GL SERIES	
P200, 32MB, Open Bay, No OS CP5036	\$1089
P166MMX, 16MB, 2.5GB, WTN-95 CP5035	\$1559
P200, 32MB, 2.5GB, WTN-95 CP5034	\$1859
P200MMX, 16MB, 2.5GB, 16X CD-ROM, WTN-95 CP5033	\$2219
NEW COMPAQ DESKPRO SERIES	
DeskPro 2000, DT, P166, 16MB, 2.1GB CP5248	\$1239
DeskPro 2000, MT, P166, 32MB, 3.2GB, 16X CD CP5254	\$1599
DeskPro 2000, DT, P200, 16MB, 2.1GB CP5252	\$1389
DeskPro 2000, MT, P200, 32MB, 3.2GB, 16X CD CP5247	\$1789
DeskPro 4000, DT, P166, 16MB, 2.4GB CP5259	\$1419
DeskPro 4000, DT, P200, 32MB, 2.4GB CP5256	\$1679
DeskPro 4000, DT, P233, 32MB, 4.2GB, 16X CD CP5253	\$2129

USA FLEX MINITOWER SYSTEMS w/512K CACHE	
Flex Special 6686-PR166, 16MB, 2.0GB, 4MB/3D, 16x CD CP5413	\$999
Flex Performer 6686-PR200, 32MB, 4.0GB, 4MB/3D, 20x CD CP5414	\$1399
Flex Ultra Performer 6686-PR244, 52MB, 4.0GB, 4MB/3D, 20x CD CP5415	\$1849
CyberNet2 15" Monitor & Printer p/200MMX, 32MB, 2.0GB, 2MB/3D, 20x CD R4349	\$1999
Basic Workstation & 14" Monitor p/166, 32MB, 2.0GB, 1MB/6+bit, 16x CD R4348	\$1199
Business Workstation & 17" Monitor p/200MMX, 32MB, 4.0GB, 2MB/128-bit, 20x CD R4347	\$1899
HEWLETT-PACKARD VECTRA VL/VE w/ 2MB VID. MEM.	
VL5-DT-166MMX DT, 166MMX, 16MB, 16GB, 256MB, CP5212	\$1199
VL5-DT-200MMX DT, 200MMX, 16MB, 25GB, 256MB, RX CD, CP5224	\$1829
VL5-MT-166MMX DT, 166MMX, 16MB, 25GB, 512KB, CP5225	\$1299
VL5-MT-200MMX DT, 200MMX, 16MB, 25GB, 512KB, RX CD, CP5227	\$1729

EPSON	
DFX-5000+/8000 PR11495/PR11694	\$1579⁹⁵/2499⁹⁵
Stylus Color 400 PR12121	\$199⁹⁵
Stylus Color 600 PR12126	\$299⁹⁵
Stylus Color 800 PR12127	\$449⁹⁵
Stylus 1520 PR12130	\$799⁹⁵
Stylus Color Photo PR12380	\$469⁹⁵
BROTHER	
HL-720 (Windows Only) PR11689	\$299⁹⁵
HL-730DX (Window & DOS) PR11752	\$329⁹⁵
HL-760 (1200x600) PR12043	\$399⁹⁵
HL-1060 (10ppm) PR12042	\$899⁹⁵
MFC-690 (thermal) PR11488	\$289⁹⁵
MFC-1950+ (ribbon) PR11487	\$449⁹⁵
MFC-4550 (laser) PR11715	\$799⁹⁵
MFC-6550MC (laser) PR11716	\$999⁹⁵

LEXMARK	
Color JetPrinter 250 PR11929	\$199⁹⁵
2380/2381 Plus Dot Matrix Printer	\$189⁹⁵
ML1238/PR12319	\$319⁹⁵/429⁹⁵
2380/2391 Plus Dot Matrix Printer	\$389⁹⁵/469⁹⁵
ML1238/PR12325	\$389⁹⁵/469⁹⁵
4079 Plus PR11318	\$289⁹⁵
4039 10 Plus PR11256	\$899⁹⁵
Optima 10 Plus PR11421	\$999⁹⁵
Optima LX+Optima LX+ PR11422/PR11699	\$1599⁹⁵/1999⁹⁵
Optima C PR11423	\$429⁹⁵
Optima S 1250 12ppm PR12345	\$1089⁹⁵
Optima S 2450 24ppm PR12340	\$2179⁹⁵
Optima N-240/Optima N-245 w/16MB RAM	\$2799⁹⁵/3299⁹⁵
NEC	
SuperScript 860 (laser) PR11494	\$399⁹⁵

DIGITAL IMAGING	
SONY	
Digital Matica NYC-PDS Camera D6346	\$399⁹⁵
DSC-F1 Digital Zoom Camera D63191	\$699⁹⁵
KODAK	
DC30 Digital Camera NP0090	\$199⁹⁵
DC50 Digital Zoom Camera NP0647	\$699⁹⁵
DC120 Digital Zoom Camera NP1132	\$999⁹⁵
VITVITR	
VitCam 3000 Digital Camera D6357	\$249⁹⁵
MICROTEK	
Scanner E3 Flatbed Scanner D5573	\$199⁹⁵
Scanner B3 Flatbed Scanner D5595	\$329⁹⁵
Scanner D6 Pro Flatbed Scanner D5594	\$329⁹⁵
UMAX	
Astra 600P Flatbed Scanner D6253	\$199⁹⁵
Astra 600S Flatbed Scanner D61145 (NEW ONLY)	\$199⁹⁵
MDX 8000 Digital Camera D6151	\$479⁹⁵

TOSHIBA	
Libretto 50CT P75 6.1" TFT, 7.2MB CP5205	\$1049
Satellite 220CDS P133, 12.1" DSTN, 1.3GB CP5166	\$1049
Satellite Pro 440C/D, P133MMX, 12.1" DSTN, 1.3GB CP5209	\$2399
Satellite Pro 440C/D, P133MMX, 12.1" TFT, 1.3GB CP5210	\$2399
Satellite Pro 460C/D, P166MMX, 12.1" TFT, 2.0GB CP5208	\$4199
Tecra 520C/D, P166MMX, 12.1" TFT, 2.1GB CP5206	\$4499
Tecra 530C/D, P166MMX, 12.1" XGA/TFT, 2.1GB CP5207	\$4899
Portege 300CT P133MMX, 10.4" TFT, 1.3GB CP5204	\$3399
HITACHI Vision Book Series	
P133, 1.4GB, 16MB, 10X, 12.1" FASTEN	\$1799
P150MMX, 1.4GB, 16MB, 10X, 12.1" FASTEN	\$2499
CP5240	\$3499
CP5241	\$3499
HEWLETT-PACKARD Omnibook 5700	\$700CT, P150 MMX, 2GB, 12.1" TFT CP5055
5700CT, P166 MMX, 3GB, 12.1" TFT CP4506	\$5199

NOTEBOOK COMPUTERS	
IBM ThinkPad	
380 P150, 1.0GB, 16MB, 12.1" DSTN CP4775	\$1749
380 P150, 1.3GB, 16MB, RX, 12.1" DSTN CP4773	\$1999
3800 P150MMX, 2.1GB, 16MB, RX, 12.1" TFT CP4774	\$3299
560 P100, 810MB, 8MB, 11.3" DSTN CP2901	\$1899
560 P133, 2.1GB, 8MB, 11.3" DSTN CP4220	\$1899
760XD P166MMX, 3GB, 32MB, RX, 12.1" XGA TFT CP4435	\$5099
TEXAS INSTRUMENTS	
610CD, P150, 1.4GB, 16MB, 10X CD, 11.3" DSTN CP4934	\$1949
610C/D, P150, 1.4GB, 16MB, 10X CD, 11.3" TFT CP4933	\$2549
COMPAQ Armada Series	
4150 P150MMX, 1.6GB, 16MB, 10X, 21.1" CSTN CP5293	\$2999
4160T P166MMX, 2.0GB, 16MB, 10X, 12.1" CRT CP5294	\$3999
5130DM P133MMX, 1.4GB, 16MB, 33.6, 10X, 12.1" CSTN CP5292	\$2899
5800DMT P150MMX, 2.1GB, 16MB, 33.6, 10X, 21.1" CRT CP5295	\$3999

TARGUS
A LEATHER BAG FOR YOUR NOTEBOOK COMPUTER

572494

IBM LAPTOP 3800	
150MHz Pentium Processor	
1.3GB Hard Drive	
16MB RAM	
12.1" DSTN SVGA Color Display	
RX CPU KVM	
\$1999	
COMPAQ DESKPRO 2000	
Intel Pentium 166MHz w/MX	
16MB RAM	
2.1GB HDD	
\$1239	
PALMTOP 320XL	
640 x 360 Backlit Screen	
4MB CP4970	
\$469	
EPSON Stylus Color Photo	
6 Color Printing	
\$499⁹⁵	
PR12390	

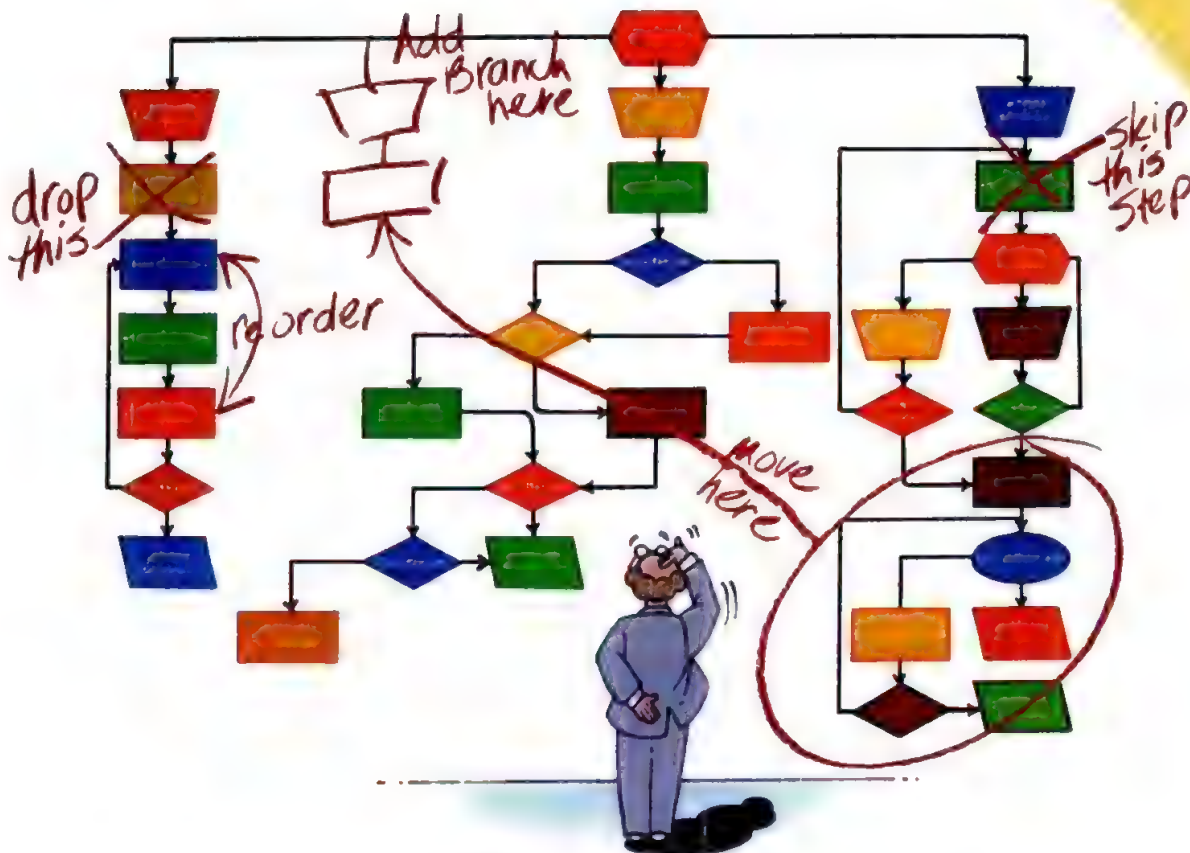
HEWLETT-PACKARD	
300XL w/ 2MB PR1497	\$469
NEW!	
Stylus Color Photo	\$499⁹⁵
PR12390	

171 Brighton Drive
Bloomington, IL 61818
Phone: 618-894-0415
Fax: 618-894-7201
6AM-11PM (CT) Mon-Fri
9AM-10PM Sat & Sun

1-800-766-1940

"allCLEAR
is a
must-buy"

- Computer
Shopper



Fast flowcharts, instant revisions

Do more in less time

allCLEAR, the Smarter Flowcharter, helps everyone in your organization work smarter. In addition to documenting processes, it helps you think through the logic of your processes, communicate effectively, train people on procedures and much more. Use allCLEAR throughout your organization for:

- Quality management
- Audit documentation
- ISO/QS 9000 certification
- Business process reengineering
- Systems design
- Training and more

Create charts easily

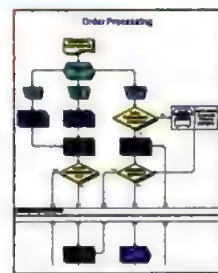
allCLEAR creates flowcharts as fast as you can type the words that go in the boxes. allCLEAR is the only flowcharter that automatically creates a chart from a simple text outline. Or, you can drag and drop shapes and branches to easily build charts. Whichever way you work, no other tool makes creating your diagrams this fast.

All the chart types you need

- allCLEAR is the fastest and easiest way to create:
- flow charts
 - fishbone diagrams
 - organization charts
 - deployment charts
 - procedure diagrams
 - network diagrams
 - process maps
 - and more

Reroute, redraw, resize instantly

allCLEAR makes revising flowcharts, especially complex ones, easy. When you make changes, allCLEAR instantly reroutes, redraws and resizes your diagram for you, saving you hours of work. And, allCLEAR is loaded with options to help you make your diagrams look great: diagram templates, fonts, colors, shapes, special effects, line styles, page layouts and much more.



Logical page breaks and page connectors are just some of the ways allCLEAR makes revising complex charts easy.

Get the Smarter Flowcharter

Two out of three allCLEAR customers tried other products first, then switched to allCLEAR, the Smarter Flowcharter. Why? Because simple drawing tools can't handle all the details of real-world flowcharting the way allCLEAR does. For our free evaluation kit, including a free demo, visit us at <http://www.spss.com/software/allclear>. Or call 1 (800) 543-5833.

allCLEAR
The Smarter Flowcharter™



OVER 36,000

• SUPER LOW PRICING • SATISFACTION GUARANTEED

FREE SHIPPING*
on All Notebook Purchases
*UPS GROUND ONLY

NOTEBOOKS & ACCESSORIES

PRICE WATCH
Call or check FBI Internet Site
for latest pricing!
www.firstsource.com



TOSHIBA NOW ONLY \$2,421

Satellite Pro 440CDX

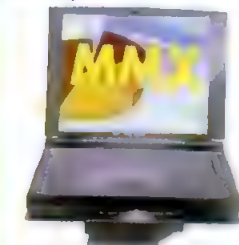
- 133MHz Pentium Processor with MMX
- 10X CD-ROM & Stereo Sound
- 16MB EDO RAM & 1.4GB Hard Drive
- 12.1" Super VGA Color Display



IBM Business Partner NOW ONLY \$2,375

ThinkPad 380D

- 150MHz Pentium Processor
- 8X CD-ROM with Stereo Sound
- 16MB RAM & 1.3GB Hard Drive
- 12.1" Super VGA Color Display



NEC NOW ONLY \$2,335

Versa 2650CD

- 150MHz Pentium Processor with MMX
- 10X CD-ROM & Stereo Sound
- 16MB RAM & 1.4GB Hard Drive
- 12.1" Super VGA Color Display
- Includes 33.6 PC Card Faxmodem

ACCESSORIES

16MB Memory Upgrade..... NOW ONLY \$119

4 Year Extended On-Site Service Warranty..... NOW ONLY \$199

Extra Battery..... NOW ONLY \$219

Port Replicator..... NOW ONLY \$449

16MB Memory Upgrade..... NOW ONLY \$119

4 Year Extended On-Site Service Warranty..... NOW ONLY \$199

Extra Battery..... NOW ONLY \$255

Port Replicator..... NOW ONLY \$299

16MB Memory Upgrade..... NOW ONLY \$159

4 Year Extended On-Site Service Warranty..... NOW ONLY \$199

Extra Battery..... NOW ONLY \$205

Port Replicator..... NOW ONLY \$159

NOTEBOOK COMPUTERS

TOSHIBA

50CT P-25 16MB 810MB 4.1TFT	\$1,936
220CDS P-133 16MB 1.4GB 12.1TFT 10X	\$1,936
440CDS P-133MMX 16MB 1.4GB 12.1TFT 10X	\$2,421
440CDS P-133MMX 16MB 1.4GB 12.1TFT 10X	\$3,299
440CDS P-166MMX 32MB 2GB 12.1TFT 10X	\$4,169
500CT P-133MMX 25MB 1.4GB 10.4TFT 10X 33.6	\$3,389
500CDS P-120 16MB 1.3GB 12.1TFT 6X	\$2,905
510CDS P-133 16MB 2GB 12.1TFT 10X 28.8	\$2,965
550CDS P-166MMX 32MB 2GB 12.1TFT 10X 33.6	\$4,559
550CT P-133 16MB 1.3GB 11.3TFT	\$3,019
600CDS P-150 16MB 1.3GB 11.3TFT 10X	\$4,249
7300CDS P-150MMX 16MB 2GB 12.1TFT 10X 28.8	\$4,648
740CDS P-166MMX 16MB 2GB 12.1TFT 10X 28.8	\$5,714

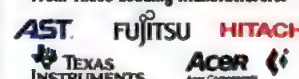
IBM

3650CD P-133 8MB 1.3GB 11.3TFT 6X	\$1,936
380 P-150 16MB 1GB 12.1TFT	\$2,130
3800 P-150 16MB 1.3GB 12.1TFT 6X	\$2,375
3800 P-150MMX 16MB 2GB 12.1TFT 6X	\$3,777
510CDS P-133 16MB 1.3GB 11.3TFT	\$2,421
540 P-133 8MB 2GB 12.1TFT	\$3,874
540E P-150MMX 16MB 2GB 11.3TFT	\$2,711
540E P-166MMX 16MB 2GB 12.1TFT	\$4,259
740E P-150 16MB 2GB 12.1TFT	\$4,067
740E P-133 16MB 2GB 12.1TFT 6X	\$4,455
7400E P-166MMX 16MB 2GB 12.1TFT	\$4,842
7400E P-166MMX 32MB 3GB 12.1TFT 6X	\$6,296

NEC

2400 P-100 8MB 1GB 11.3TFT	\$1,420
2530 P-133 16MB 1GB 12.1TFT 6X	\$1,645
2630 P-133 16MB 1.4GB 12.1TFT 10X	\$1,899
2650 P-133MMX 16MB 1.4GB 12.1TFT 10X	\$2,335
2650 P-150MMX 16MB 1.4GB 12.1TFT 10X	\$3,331
6030 P-133 16MB 1.3GB 12.1TFT 6X 28.8	\$3,618
6030 P-150MMX 16MB 1.4GB 12.1TFT 10X 28.8	\$3,808
6050 P-150MMX 16MB 2GB 12.1TFT 10X 28.8	\$4,474
6200 P-166MMX 32MB 2GB 12.1TFT 10X 28.8	\$5,425

Many More Notebook Systems Available
From These Leading Manufacturers:



HARD DRIVE UPGRADES

Maxtor

• Easy installation
• Available in 1.44GB to 3.0GB
• 3 Year Warranty

Infinity notebook hard drive solutions are available in a range of capacities for your notebook computer.

NEW LOWER PRICING!

1.4GB	\$339
2.1GB	\$589
3.0GB	\$889

TOSHIBA IBM COMPAQ NEC

CARRYING CASE

LEATHER NOTEBOOK CASE \$59

NOTY PAC PLUS \$59

SHUTTLE NOTEBOOK CASE \$99

SHUTTLE UNIVERSAL CASE \$129

TARGUS

FAX MODEMS

Robotics

NEW! 56k PC Card Faxmodem w/XJACK

- 56k Ready Models
- 56k Upgradeable Models
- XJACK Connector

XJ1336 - 33.6, 56k Upgradeable	\$211
XJ1560 - 56k Ready	\$269
XJ4336 - 33.6	\$239
All Ports Wireless	\$470
XJEM3336T - 33.6 + LAN	\$305

PRINTERS

GREAT VALUE!

OKIDATA

OKIDATA OKI PAGE 4W PRINTER

- 4PPM
- Plug-n-Play
- +600dpi Class Output Quality in Win
- For Windows 95 or Win 3.1

Okidata 4W \$199

Okidata 6W \$299

Okidata 8W \$399

NEW LOWER PRICING!

PORTABLE ORGANIZER

NEW!

NOW WITH BACKLIT DISPLAY

PAIPILOT POCKET ORGANIZER

Store daily tasks on the go. Stay in touch with your PC. Stay on top of your life. Only with the PAIPILOT.

PAIPILOT Personal	\$399
PAIPILOT Professional	\$399
PAIPILOT Professional	\$399
PAIPILOT Professional	\$399
PAIPILOT Professional	\$399
PAIPILOT Professional	\$399
PAIPILOT Professional	\$399
PAIPILOT Professional	\$399
PAIPILOT Professional	\$399
PAIPILOT Professional	\$399

STORAGE

Iomega Ext. Zip Drive 100MB	\$149
Iomega Ext. Ditto 2GB Tape Drive	\$149*
Iomega Ext. Ditto 3GB Tape Drive	\$199*
SyQuest Ext. EZFLYER Drive 230MB	\$234
SyQuest Ext. Stylizer Drive 1GB	\$499
MicroSolutions Ext. 800T	
8GB Tape Drive	\$466

*Show Mail to Manufacturer Labels (White applies best)

BATTERIES

Toshiba 110, 200 Series	\$99
Toshiba 400, 410, 420, 430	\$189
Toshiba Teora 500, 510	\$259
NEC Versa 2400 Series	\$159
NEC Versa 6000 Series	\$229
TI TM6000 Series	\$229
Fujitsu Lifebook 500 Series	\$249
Hitachi E Series	\$119

FAXMODEMS & LAN

Motorola Montana 33.6 PC Card	\$184
Motorola Mariner 33.6 +	
10BT PC Card	\$307
Xircam CreditCard 33.6 PC Card	\$220
Xircam CreditCard 33.6 +	
10BT PC Card	\$316
Xircam CreditCard 10/100	
10BT/100TX PC Card	\$179

PRINTERS

HP DeskJet 670C	\$409
HP DeskJet 692C	\$299
HP DeskJet 870C9	\$389
HP LaserJet 6L	\$399
HP LaserJet 6P	\$736
Epson Stylus Color 400	\$229
Epson Stylus Color 600	\$289
Epson Stylus Color 800	\$419

SOFTWARE

Office 97 Standard Upgrade	\$191*
Office 97 Professional Upgrade	\$285*
Office 97 Standard Full Version	\$464
Office 97 Professional Full Version	\$557

*After manufacturer mail-in rebate (white applies best)

THOUSANDS OF SOFTWARE TITLES AVAILABLE!



DIRECT TOP SIXTY

PC Computing

★★★★★

FOUR STAR WINNER

800-501-9866

www.firstsource.com

VISA MasterCard

TERMS & CONDITIONS: Credit and cash shipped only to your verified billing address. All orders must be a brand new credit, including all signed receipts, warranty cards, manuals and accessories and may be subject to a 20% restocking fee. All returns and exchanges must be made within 15 days of purchase date. FSI accepts returns on computers, printers, scanners, memory and software for repair or replacement only. Shipping and insurance charges are non-refundable. A return Merchandise Authorization (RMA) number is required for all returns. Please contact our customer service department. Return products are third party and manufacturer's part numbers are for your convenience. Due to U.S. traffic placed on some electronic, memory pricing may be higher than advertised. Prices and availability subject to change without notice. Purchase price at time of order on hand. FSI cannot be responsible for errors in typographic or photographic reproductions and registered trademarks are of their respective companies.

FIRST SOURCE INTERNATIONAL

PRODUCTS

**HARDWARE
SOFTWARE
& MEMORY**

**First
SOURCE
International**
Computer Hardware & Software

• KNOWLEDGEABLE SALES STAFF • DISCOUNT SHIPPING CHARGES

STANDARD MEMORY - SIMMS & DIMMS

168-PIN DIMMS (SDRAM)

2x64 (16MB)..... **\$99**
4x64 (32MB)..... **\$199**

30-PIN SIMMS

1x3-70 (3-chip/1MB)..**\$9**
1x9-70 (9-chip/1MB)..**\$14**
4x3-70 (3-chip/4MB)..**\$25**
4x9-70 (9-chip/4MB)..**\$34**

72-PIN SIMMS (EDO)

1x32-60 (4MB)..... **\$21**
2x32-60 (8MB)..... **\$36**
4x32-60 (16MB)..... **\$81**
8x32-60 (32MB)..... **\$158**
*Install in Pairs for Parity Systems

160-PIN Pipeline Burst Cache

256K Cache Module... **\$19**
512K Cache Module.. **\$35**

72-PIN SIMMS (Parity)

1x36-70 (4MB)..... **\$25**
2x36-70 (8MB)..... **\$49**
4x36-70 (16MB)..... **\$97**
8x36-70 (32MB)..... **\$189**

72-PIN SIMMS (Non-Parity)

1x32-70 (4MB)..... **\$21**
2x32-70 (8MB)..... **\$37**
4x32-70 (16MB)..... **\$81**
8x32-70 (32MB)..... **\$159**



- 100% GUARANTEED
- LIFETIME WARRANTY
- EASY TO INSTALL
- FREE TECHNICAL SUPPORT



Kingston
TECHNOLOGY CORPORATION

- ISO 9001 CERTIFICATION
- 100% PRODUCT TESTING
- FREE TECHNICAL SUPPORT
- COMPREHENSIVE WARRANTY
- IBM SERVICE AGREEMENT

DESKTOP MEMORY

AST	Power 4/33 Integral, 4/25 Pentium, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984
------------	---



**Quality computing
at a comfortable
price.**

Everex AGI Series

16MB EDO RAM

512K Cache
1.2GB EIDE Hard Drive
16X EIDE CD-ROM
3.5" Floppy Drive
2MB DRAM Graphics Accelerator
Sound Blaster® Compatible Sound
12 Watt Speakers
Windows® 95
Microsoft® Software Bundle
Keyboard/Mouse
14" .28 SVGA Color Monitor

Intel 150MHz Pentium® processor **\$1,099**

Intel 200MHz Pentium® processor **\$1,149**

32MB EDO RAM

512K Cache
3.1GB EIDE Hard Drive
16X EIDE CD-ROM
3.5" Floppy Drive
2MB DRAM Graphics Accelerator
Sound Blaster® Compatible Sound
12 Watt Speakers
Windows® 95
Microsoft® Software Bundle
Keyboard/Mouse
15" .28 SVGA Color Monitor

Intel 166MHz Pentium® processor
with MMX™ Technology **\$1,399**

Intel 200MHz Pentium® processor
with MMX™ Technology **\$1,529**

Intel 233MHz Pentium® processor
with MMX™ Technology **\$1,679**

32MB EDO RAM

512K Cache
2GB Ultra SCSI Hard Drive
Adaptec SCSI Hard Drive Controller
12X SCSI CD-ROM
3.5" Floppy Drive
4MB SGRAM Matrox Mystique Graphics Card
Sound Blaster® 32
12 Watt Speakers
Windows® 95
Microsoft® Software Bundle
Keyboard/Mouse

Intel 200MHz Pentium® processor
with MMX™ Technology **\$1,899**

Intel 233MHz Pentium® processor
with MMX™ Technology **\$2,049**

OPTIONS

- Matrox Graphic Cards
- 17" Color Monitors
- Diamond Graphic Cards
- Networking
- 56kbps Fax/Modems
- MS Office Pro 97



EVEREX



Everex StepNote™ Series

Everex StepNote 5

- Advanced heat-pipe cooling
- 256K L2 Cache
- Upgradable to 48MB EDO RAM
- 2MB DRAM PCI Video
- Zoom Video PCMCIA
- NTSC/PAL output (optional)
- 10X CD ROM
- Sound Blaster Pro Compatible
- Windows® 95
- Microsoft® Software Bundle
- 2 Year Warranty
- 48-Hour Hot-Swap

133MHz Intel Pentium® processor
12.1" DSTN Color
16MB EDO RAM
1.4GB HDD

\$ 1,849

150MHz Intel Pentium® processor
12.1" DSTN Color
16MB EDO RAM
2.1GB HDD

\$ 2,019

166MHz Intel Pentium® processor
with MMX™ Technology
12.1" DSTN Color
16MB EDO RAM
1.4GB HDD

\$ 2,199

150MHz Intel Pentium® processor
12.1" TFT Color
16MB EDO RAM
1.4GB HDD

\$ 2,399

150MHz Intel Pentium® processor
12.1" TFT Color
32MB EDO RAM
2.1GB HDD

\$ 2,799

166MHz Intel Pentium® processor
with MMX™ Technology
12.1" TFT Color
32MB EDO RAM
2.1GB HDD

\$ 3,249



Leapfrog Lab, Inc. is your discount

computer source for quality computer

products and user-friendliness.

As one of the industry's fastest

growing direct resellers, we also offer

a complete range of leading-edge

peripherals from Creative Labs,

Quantum, US Robotics, FIC and more.

Call for more information or visit

our website at www.leapfroglab.com

for a complete list of products and

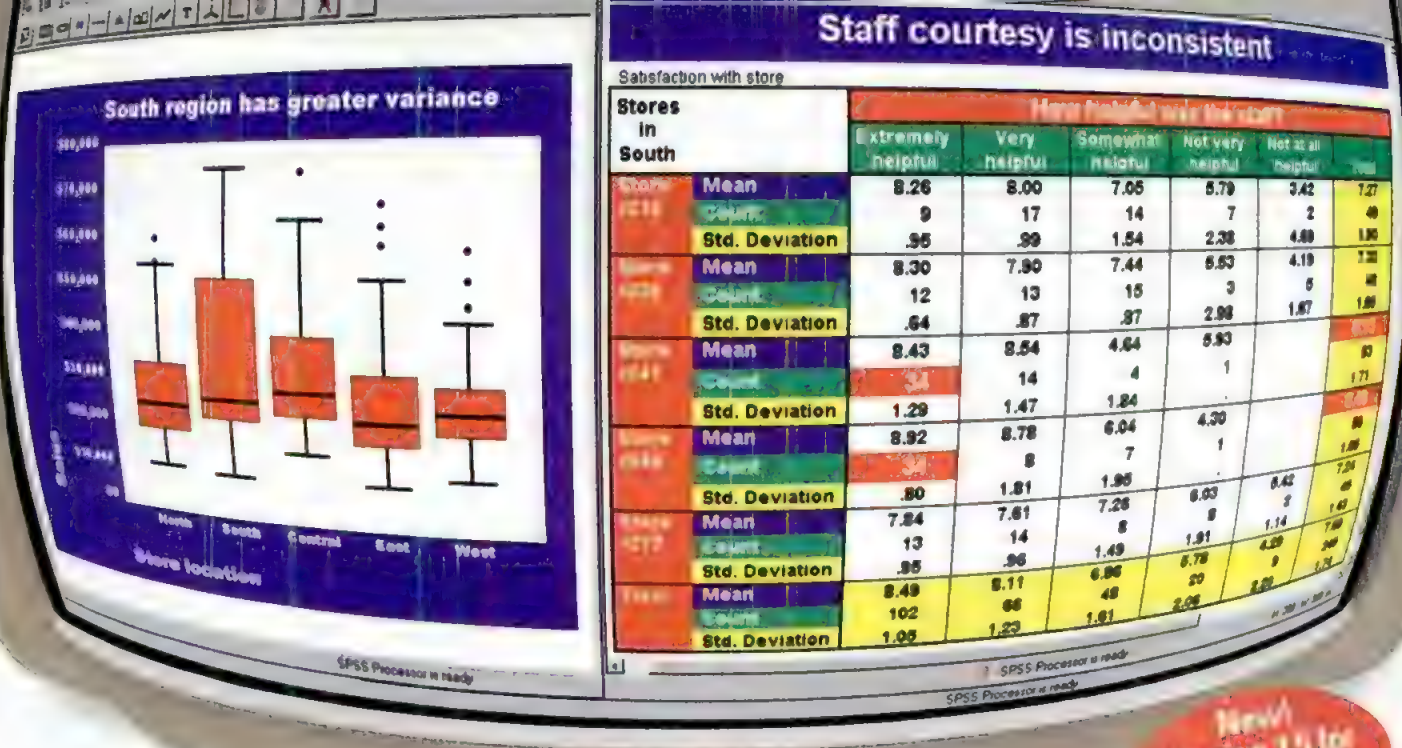
your chance to win free prizes!

Money Back Guarantee
24 Hour Toll-Free Tech Support:
1.800.262.3312
Optional Extended Warranties Available

1.800.532.7550

www.leapfroglab.com



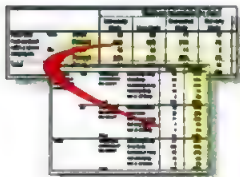


Unleash the power in your data

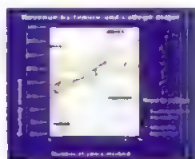
SPSS mines your data in ways no spreadsheet or reporting tool can



Go beyond spreadsheets with analytical techniques such as crosstabs, regression, factor and over 100 others.



Use SPSS' multidimensional pivot tables to discover critical information that might be buried in traditional reports.



Get the best picture of your data with over 60 high-resolution business, professional and quality charts.

The critical information you need, like the variance and distribution of your data, isn't in simple summary reports. To compete and win, you need to take the next step – advanced analysis that leads to better decisions.

Use powerful statistical methods and revealing charts to spot patterns and trends. Discover what's significant. Make better forecasts. You don't have to be a statistician to use SPSS. SPSS assists you with a tutorial, step-by-step instructions and "What's this?" help. We help you find a solution with a range of training and analytical consulting services. See our Web site for a white paper on how statistics help you achieve a competitive advantage.



SPSS
Real Stats. Real Easy.™

For more information

Call 1 (800) 543-5833

or fax 1 (800) 841-0064

Visit our site on the World Wide Web: <http://www.spss.com>
or e-mail: sales@spss.com

We speak your language with 26 offices and 60 distributors worldwide.

SPSS is used today to:

- Analyze your database
- Accurately forecast sales
- Increase customer satisfaction
- Find the most profitable segments
- Improve mailing responses

"Users will want this program for when their spreadsheets run out of steam." – PC Magazine

"...fast, powerful, robust, and a joy to use." – Windows Sources

"...easy enough for statistics newcomers, but includes features that power users require." – PC World

"...an essential tool" – PC Week

A5833

Sony VAIO PCV-120 P-200 MMX

**Powerful!
Fun to Use!
Great for
Multimedia
Lovers!**

- 200MHz MMX
- 32MB RAM
- 3.8GB HD
- 16X CD-ROM
- Win 95
- 33.6 DSVD Modem



monitor sold
separately

**Only
\$1999**

**THE BEST
PRICES ON
PC SYSTEMS!**

**Call Us
First!
800-800-CPU's**

COMPAQ Deskpro 2000

**Now with MMX[™]
Technology,
SDRAM Memory
and S3 Video
for Improved
Performance!**

- Pentium MMX
- 16MB SDRAM (384MB max)
- S3 Enhanced 64-bit Graphics
- 1MB SGRAM Video Memory Upgradeable to 2MB
- 2.1GB EIDE HD
- New Intelligent Manageability Features

monitor sold
separately



**Only
\$1199**

42757



COMPAQ Armada 1130T

**Our Lowest
Active
Matrix
Notebook**

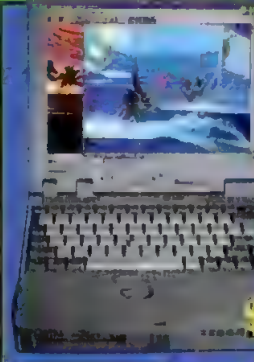
**ONLY
\$1199**

- Pentium 120
- 16MB RAM
- 10.4" Active Matrix Display
- 1.08GB HD

**SAVE
ask about...
LEASING
OPTIONS
for BUSINESS**

**NEW!
Extended
Service
Plan**

Supplement the mfr's warranty for 4 full years from date of purchase!



TOSHIBA

Tecra 500CDT Notebook!

**Light in Weight, Long on Performance!
Flexible! Expandable!**

- 120 MHz Pentium
- 16MB RAM (expandable to 144MB)
- 12.1" Active Display
- 1.26GB Hard Drive
- 6X CD-ROM
- Integrated 28.8 Kbps voice/fax/modem
- 3-Year Warranty

**Only
\$2398**

**16MB RAM
FREE!**
w/purchase of 500CDT Ask for Item #41787 while supplies last

Software!

Business	
43103	ClarisWorks Office for PC \$59*
27667	FileMaker Pro 3.0 Tradeup/Upgrade 99
40787	ClarisWorks Internet Ed. w/FREE ClickBooks 94.95
41228	BusinessBasics 34.95
35919	Visio Pro 329.95
13156	allClear 179.95
41480	Incorporate 68.95
* After \$20 rebate for upgrade customers	
Entertainment	
40862	Dark Reign 49.95
40505	Aaron vs. Ruth 39.95
32103	STARFLEET ACADEMY 54.95
33248	X-Wing vs. TIE Fighter 49.95
Graphics & Design	
41627	NetObjects Fusion 2.0 489.95
41827	Jamba 2.0 224.95
39399	PhotoTools 1.1 94.95
19877	PageTools 2.01 94.95
31150	MiniCAD 6.0 for Win 369.95
41518	Flightcheck for Win 389.95
Utilities	
32853	Norton Utilities Win 95 74.95
31822	Norton AntiVirus Win 95 69.95
35300	Partition Magic 3.0 CD 49.95*
39592	Helix Nuts & Bolts 39.95*
34905	Cybermedia First Aid 97 34.95
26134	Dr. Solomon Anti Virus Tool Kit 64.95
* After mfr. rebate	

Peripherals!

CD-ROM	
38323	Hi-Val 12X Internal IDE 595
43092	Smart & Friendly 2006 Plus Int. CD-R 395
41380	Pinnacle Micro RCDW226 Internal Rewriteable CD-R Drive 699
Printers/Scanners	
40615	HP DeskJet 694C Printer 299
40616	HP DeskJet 820Cse Printer 299
40618	HP DeskJet 870 Cse Printer 399
40621	HP LaserJet 6Lse Printer 399
40623	HP LaserJet 6Pse Printer 799
40619	HP LaserJet 5se Printer 1049
40708	HP ScanJet 5s Scanner 249
40628	HP ScanJet 5Pse Scanner 399
40627	HP ScanJet 4Cse Scanner 799
Storage	
40424	Fuji Zip Disk 20-Pack with 4 FREE Disks 240
40421	Sony TR-1 Travan Tape with \$5 rebate 19.95*
30522	MicroSolutions PD-CD Parallel Phase Dual Drive 499
32594	SyJet 1.5GB External SCSI Drive 499
32811	SyJet 1.5GB Internal IDE Drive 399
32812	SyJet 1.5GB Cartridge 124.95
32814	SyJet 1.5GB Cartridge 3-Pack 299.95
* Price shown after rebate	

SUPER LOW SIMMS!

4MB	8MB	16MB	32MB
as low as \$24.95	as low as \$49.95	as low as \$99.95	as low as \$189.95

**1MB SIMMS
as low as
\$9.95**
13020

Nuts & Bolts

The Only Fully Integrated Utilities Suite for Win 3.1 and 95!
Only \$39.95*
* \$10 Rebate 39592

FREE!

**Catalog Subscription!
CALL TODAY!**

Just Mail in a Postcard to receive
FREE! (Mention source code 97PCM1)

Name _____
Address _____
City _____ State _____ Zip _____



10,000 HOT PRODUCTS 24 HRS A DAY!

888-800-4523

www.pcconnection.com

Now shop on-line with a name you can trust!

CIRCLE 047 ON READER SERVICE CARD

PC AD 97PCM1



Blowout Prices on Leading Products!

Microware

YOUR SOURCE FOR PC SOFTWARE,

OMEGA ZIP DRIVE

ONLY **\$149⁹⁵**



New! HP LaserJet 5smx Printer

HEWLETT
PACKARD

ONLY **\$3529⁹⁵**



MAGNAVOX

Magnavox 20" Monitor

ONLY **\$699⁹⁵**



IBM ThinkPad 380

At Low As **\$1749!**

IBM



Extensa 610CD

- 150MHz Pentium® processor
- 1.4GB Hard Disk drive
- 16MB RAM EDO RAM
- 10X CD-ROM drive
- 11.3" SVGA DSTN color display

CP4934

Acer

ONLY **\$1949**

TEXAS INSTRUMENTS



COMPAQ Presario 6704 Refurb

Includes: 133MHz Pentium® II, 33.6 Kbps Modem, Scanner Keyboard

- 166MHz, 2.5GB 24MB RAM, 8X CD-ROM

FOR ONLY **\$999!**

MONITOR SOLD SEPARATELY

Whole Supplies Last

RCP4501



2.0GB KIT

Maxtor

FOR ONLY **\$189⁹⁵**

DR6643

*Price reflects \$30 manufacturer's rebate. Rebate expires 6/31/97. Ask for rebate certificate AM781



COMPAQ DESKPRO 4000

- 233MHz Pentium® II processor
- 2.5GB hard drive
- 32MB RAM
- 8X CD-ROM
- 5 slots, 4 bays

CP5023

ONLY **\$2319!**

Monitor sold separately.



HEWLETT
PACKARD

LASERJET 5SE

ONLY **\$1049⁹⁵**

PR1268



HEWLETT
PACKARD

200MHz PENTIUM® MMX PROCESSOR!

ONLY **\$1499!***

RCP4849



COMPAQ DESKPRO 2000

- 166MHz Pentium® MMX
- 2.1GB hard drive
- 16MB RAM
- 5 slots, 5 bays desktop

ONLY **\$1239!**



COMPAQ

Desk Pro 2000

Affordable and Manageable Desktop PC's

CP3377: 166MHz Processor 16MB, 1.2 GB **\$999**

CP5248: 166MHz Pentium® MMX 15MB, 2.1GB HDD Desktop **\$1239**

CP5252: 300MHz Pentium® MMX 15MB, 2.1GB HDD **\$1389**

Desk Pro 4000

Network Ready PC's

CP5259: 166MHz Pentium® MMX 15MB, 2.4 GB HDD **\$1419**

CP5256: 200MHz Pentium® MMX 32MB, 2.4GB HDD **\$1679**

CP5253: 233MHz Pentium® MMX 32MB, 3.2GB HDD 16X CD-ROM **\$2129**

Desk Pro 6000

High Performance Network PC's

CP5022: 233MHz Pentium® II 32MB, 2.1 GB SCSI HDD PDD Drive **\$2619**

CP5024: 266MHz Pentium® II 32MB, 4.2GB SCSI HDD 8X CD-ROM **\$3179**

IBM

IBM Thinkpads

CP4775: 380, 150 Pentium®, 1.0GB, 16MB RAM, 12.1" DSTN **\$1749**

CP4773: 3800, 150 Pentium®, 16MB, 6X CD-ROM, 12.1" DSTN **\$1999**

CP2907: 760L, 120MHz Pentium®, 1.0GB, 8MB/72MB, 12.1" SVGA **\$3199***

CP4774: 3800, 150MHz Pentium®, 2.1GB, 16MB, 8X CD-ROM, 12.1" TFT **\$3299**

CP3558: 760L, 150MHz Pentium®, 2.1GB, 16MB/104MB, 12.1" XGA TFT **\$3499**

CP3557: 760L, 133MHz Pentium®, 2.1GB, 16MB/80MB, 12.1" SVGA **\$3829**

CP3556: 760L, 133MHz Pentium®, 2.1GB, 16MB/104MB, 12.1" XGA TFT, 6X CD-ROM **\$3699**

CP4434: 760L, 166MHz Pentium®, 2.1GB, 16MB, 12.1" TFT **\$4119**

CP4433: 760L, 166MHz Pentium®, 2.1GB, 32MB, 12.1" TFT **\$4299**

CP4435: 7600, 166MHz Pentium®, 3GB, 32MB, 8X CD, 12.1" XGA TFT **\$5069**

*While supplies last!

TOSHIBA

Toshiba Laptops

CP5205: 50CT, 75MHz Pentium®, 772MB, 6.1 TFT, 1.8lbs **\$1949**

CP5168: 220CD, 133MHz Pentium®, 1.34GB HDD, 16MB RAM, 10X CD-ROM, 12.1" SVGA DSTN **\$1949**

CP5204: 300CT, 133MHz MMX Pentium® 1.51GB HDD, 33.6 Kbps, 10.4" TFT **\$3399**

CP5209: 440CDX, 133MHz MMX Pentium®, 1.34GB HDD, 10X CD, 12.1 FAST SCAN **\$2399**

CP5210: 440CDT, 133MHz MMX Pentium®, 1.34GB, HDD, 12.1" TFT, 10X CD **\$3099**

CP5208: 460CDT, 166MHz MMX Pentium®, 2.02GB HDD, 10X CD, 33.6 Kbps, 12.1" TFT **\$4199**

BN4328: 500CT, 120MHz, 1.2GB HDD, 12.1" SVGA TFT, 6X CD-FREE 16MB Upgrade **\$2399***

CP3902: 510CDT, 133MHz, 2.1GB HDD, 12.1" SVGA TFT, 10X CD **\$2999***

CP4138: 730XCT, 150MHz MMX Pentium®, 2.02GB HDD, 12.1" TFT, 10X CD **\$3999***

CP4138: 740CDT, 166MHz MMX Pentium®, 2.02GB HDD, 13.3" TFT, 10X CD **\$4999***

*While supplies last!

HP LASERJET 6LSE PRINTER

New! FOR ONLY **\$399⁹⁵**

PR12310

- Prints up to 8ppm
- 500 x 600dpi
- HP's Resolution Enhancement technology for smoother grays and sharper blacks

HEWLETT
PACKARD



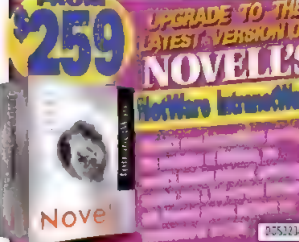
FROM \$259

UPGRADE TO THE LATEST VERSION OF

NOVELL'S NetWare Infrastructure

Novell

0056204



1440dpi Printing!

EPSON

ONLY **\$299⁹⁵**

PR1215



Microsoft Office 97 Pro Upgrade!

Professional Edition with Microsoft IntelliMouse

Includes all applications in the professional edition, plus the Microsoft IntelliMouse

ONLY **\$299⁹⁵**

SI2440

Microsoft Office



- Visa and MasterCard accepted. Your credit card will not be charged until your order is shipped.
- Purchase orders subject to credit approval.
- All products covered by 30-day limited warranty. Defective software replaced immediately. Hardware replaced or repaired at our discretion.
- Connecticut, New Jersey, Illinois and Ohio residents add applicable sales tax.
- Orders for in-stock items placed by 12:00 midnight (E) weekdays, (barring system failure, etc.) ship overnight by Airborne Express. (Some areas require an extra day).
- We reserve the right to limit quantities.
- Shipping charge \$9.95
- per order up to 7 lbs. \$1.25 per lb. above 7 lbs.
- UPS ground service also available at current UPS rates plus \$2.95 handling charge per order except COD. UPS orders placed by 3:00 p.m. (E) weekdays, ship same day.
- Actual freight charges apply for computers, hard disks, Bernoulli's, tape backups, monitors, and printers.
- Alaska, Hawaii, outside continental U.S., APO/FPO call for information.
- Item availability and price subject to change without notice.
- Some products not available outside U.S. Please call for more information.
- Not responsible for errors or omissions.

WAREHOUSE

HARDWARE AND PERIPHERALS

FREE! JAVA TUTORIAL

New!

IBM ThinkPads



BLOWOUT!
AS LOW AS
\$6129!

13.3" XGA TFT DISPLAY!

IBM ThinkPad 765

- 166MHz MMX Pentium® processor
- 32MB RAM • 3GB Hard Drive
- 256KB Cache • 13.3" XGA TFT color display

CP5039.....\$6129



IBM ThinkPad 765D

CP5040: 166MMX processor, 3GB hard drive, 32MB RAM, 8X CD-ROM, 256KB Cache, 13.3" XGA TFT color display.....\$6699

VISIONBOOK PLUS 4140

New!

ONLY
\$1799

- 133MHz Pentium® MMX Processor
- 1.4GB HDD
- 16MB RAM
- 12.1" HA-STN display
- 10X CD-ROM
- 33.6 Kbps Modem

HITACHI CP5239

IBM PC300XL PENTIUM® II DESKTOP



- P2/233MHz Pentium® Processor
- 32MB RAM
- 2.5GB Hard Drive
- Windows 95

Monitor sold separately.

CP4768



TOSHIBA SATELLITE 220CDS

AS LOW AS
\$1949

- 133MHz Pentium® processor
- 1.34GB hard disk drive
- 16MB EDO RAM
- 10X CD-ROM drive

CP5166



TOSHIBA

SEAGATE MEDALIST™

1.2 GB IDE HARD DRIVE

ONLY
\$179.95!



DR5652 Seagate

IONEGA JAZZ DRIVE

INTERNAL 100MB DRIVE

\$299.95!



DR4840

HEWLETT PACKARD DESKJET 855CXI PRINTER

ONLY
\$289.95*



LOWOUT! PR12411 W.S.L.

NEW! LS-120 Diskette Drive from Precision Instruments

SPECIAL OFFER: SAVE \$10 WHEN YOU PURCHASE WITH 10 MINIMUM DISKETTES. ASK FOR DR653

ONLY
\$199.95!



DR6430

SPORTSTER 56K MODEM

INTERNAL FIM ONLY

\$197.99!



Internal DR6239 EXTERNAL DR6240

NEW! DVD TECHNOLOGY

- Watch theater-style video
- Retrieve up to 7 times more data than standard CD-ROM!
- Includes MPEG card
- Listen to hi-fi audio

\$499.99!



DR6307 Creative

D-200L DIGITAL CAMERA

OLYMPUS

ONLY
\$599!



IMP0070

Storage Warehouse

IDE Hard Drives Starting at
\$179.95

SEAGATE HARD DRIVES (IDE)

DR5652 ST31276A 1275MB	\$179.95
DR5767 ST32132A 2113MB	\$199.95
DR5655 ST52520A 2560MB	\$219.95
DR6333 ST33240A 3240MB	\$289.95
DR6331 ST36450A 6450MB	\$539.95

WESTERN DIGITAL HARD DRIVES (IDE)

DR6112 Caviar 11200 1.2GB	\$179.95
DR5594 Caviar 22100 2.1GB	\$189.95
DR5595 Caviar 22100 2.1GB	\$209.95
DR5359 Caviar 33100 3.1GB	\$259.95
DR5972 Caviar 34000 4.0GB	\$339.95

IBM HARD DRIVES (IDE)

DR5732 Deskstar 2.1GB	\$239.95
DR5731 Deskstar 3.24GB	\$279.95

QUANTUM HARD DRIVES (IDE)

DR6544 Fireball ST 31620ST 1.6GB	\$219.95
DR6543 Fireball ST 321160ST 2.1GB	\$230.95
DR6542 Fireball ST 33240ST 3.2GB	\$299.95
DR6541 Fireball ST 34320ST 4.3GB	\$369.95
DR6524 Fireball ST 36480ST 6.4GB	\$669.95

MAXTOR HARD DRIVES (IDE)

DR6030 Maxtor K0182100A 2.1GB	\$199.95*
DR6069 Maxtor K0182500A 2.5GB	\$219.95*
DR6661 Maxtor K0183500A 3.5GB	\$279.95*
DR6390 Maxtor K0184300A 4.3GB	\$299.95*
DR6880 Maxtor K0185120A 5.1GB	\$369.95*
DR6557 Maxtor K0187000A 7.0GB	\$449.95*

*Price reflects manufacturer's \$30 Mail-in rebate. Ask for AD791. Offer expires 8/1/97

MICROPOLIS HARD DRIVES (SCSI)

DR6091 4345NS 1	\$949.95
DR6089 4345WS 1	\$949.95
DR6088 3391NS 9.1GB	\$1419.95
DR6093 3391WS 9.1GB	\$1429.95

QUANTUM HARD DRIVES (SCSI)

DR6227 Fireball ST 32160ST 2.1GB	\$319.95
DR6526 Fireball ST 33240ST 3.2GB	\$399.95
DR6523 Fireball ST 4.3GB	\$529.95
DR6524 Fireball ST 36480ST 6.4GB	\$669.95

SEAGATE HARD DRIVES (SCSI)

DR5638 ST32171N 2.15GB	\$549.95
DR5640 ST32171W 2.15GB	\$599.95
DR5639 ST34371N 4.35GB	\$839.95
DR5636 ST34371W 4.35GB	\$869.95
DR5641 ST19171N 9.1GB	\$1479.95
DR5637 ST19171W 9.1GB	\$1579.95

WESTERN DIGITAL HARD DRIVES(SCSI)

DR6103 W/D Enterprise 2.17GB	\$519.95
DR6106 W/D Enterprise 4.36GB	\$759.95

IONEGA DITTO TAPE DRIVES

DR5402 Ditto 2GB Int. 2GB	\$149.95
DR5401 Ditto 2GB Ext. 2GB	\$199.95

IONEGA JAZZ DRIVE

DR4540 Internal 1GB	\$299.95
DR1119 External 1GB	\$399.95
ME6478 1.0GB Jaz Disk	\$124.95*

*Quantity pricing available

Free Catalog Subscription

Check the appropriate box(es) to receive a free, one-year subscription and mail this coupon to:
1720 Oak Street, P.O. Box 3014, Lakewood, N.J. 08701-3014

Name: _____
Address: _____ E-Mail: _____
City: _____ State: _____ Zip: _____

- ☐ MicroWAREHOUSE ☐ Micro STORES WAREHOUSE
☐ MacWAREHOUSE ☐ Data Comm WAREHOUSE

(Expect to receive your next issue within 4-6 weeks).

©Copyright 1997 MicroWarehouse, Inc. MacWAREHOUSE® is a division of MicroWarehouse, Inc. MacWAREHOUSE® and MicroWarehouse® are registered servicemarks of MicroWarehouse, Inc.

PPM7



To order, call toll-free 24 hours a day, 7 days a week

1-800-469-3619

In the Internet
<http://www.warehouse.com>

Fax: 908-905-5245

Order until 12:00 midnight (E) weekdays for overnight delivery of "in stock" items — only \$9.95!

*Shipping charge \$9.95 per order up to 7 lbs., \$1.25 per lb. over 7lbs.

CALL FOR A FREE CATALOG!



BOOK The Ben



www.pcmag.com
At the top of
discriminating
bookmark lists
everywhere.



Your link to
the best of the
best products in
every category.

*How do you want your information?
Up-to-date... or up-to-the-minute? There's
simply no more timely source for vital prod-
uct information than PC Magazine Online.*

*In fact, with a dedicated staff of writ-
ers and editors who continuously refresh
and up-date PC Magazine Online's content,
this is as close to "live" as the industry gets.*

*At www.pcmag.com you'll also find
other valuable resources that you can't get
anywhere else — not even in PC Magazine.
Industry news and trends literally as they
are happening. Plus valuable multimedia*

NEWSWATCH

What's happening
today, and what it means —
along with up-to-the minute
news streamed from the
industry press.

INSITES

HARD-HITTING OPINIONS,
AND SAVVY WEB INSIGHTS FROM
MICHAEL J. MILLER (EDITOR-IN-
CHIEF), DON WILLMOTT (EXECU-
TIVE EDITOR, ONLINE), PLUS
"NEWS, VIEWS AND SNIDE ASIDES"
FROM JOHN C. DVORAK.

MARK chmark.

InternetUser

The most complete and current guide to Internet software and tools — an indispensable resource for any serious Netizen.

content that seamlessly complements and enhances the print edition, and makes it easy (even fun) to dig out that exact nugget of information you need.

Take advantage of customizable product comparisons and interactive navigation tools that streamline product selection.

Follow-up links to earlier PC Magazine articles. And, of course, stay a step ahead of the pack on the very latest hardware, software and technology developments.

So drop in, any time — but plan to stay awhile. You'll find lots of good reasons to add one more URL to your "daily" folder: www.pcmag.com.

PC LABS Online

ALL THE GOOD STUFF YOU EXPECT FROM PC LABS, WITH INTERACTIVE FEATURES THAT MAKE IT EVEN EASIER TO DRILL DOWN TO THE INFORMATION YOU NEED.



**THE
BENCHMARK**



A Handful Of Reasons To Buy The New Backpack® Bantam™ CD-ROM Drive.



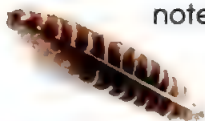
Multi-media capabilities. CD-ROM and Windows™ sound in one package (also available without sound)

It's the smallest, the fastest, and the best-looking, lightweight parallel port CD-ROM drive available—and it fits in the palm of your hand. It's the new backpack bantam CD-ROM drive with integral Windows™ stereo sound. You'll tote it any-



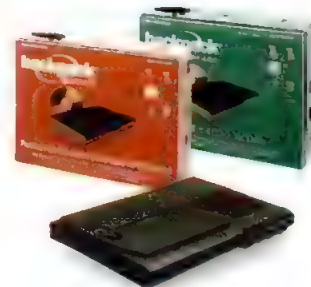
One cable connection puts portability in your hands. Cool!

where. Everywhere. Installation is a breeze. Simply plug this handy little drive into the printer port of any IBM-compatible pc or notebook. Use it with Windows (95, 3.X, NT*), DOS*, and OS/2*. What about your printer? The bantam has smart printer pass-through. It's a lot to put in one sleek package, but we did it.



A travel light CD-ROM solution

Free
CASE LOGIC® carrying case with purchase.
A \$32⁹⁹ suggested retail value.
(Limited Time Offer)



backpack®
bantam™

MicroSolutions
The port•ability leader.

Ph: 800-293-1214 (US and Canada)
or 815-756-3411, Fax: 815-756-2928
Internet: www.micro-solutions.com



FamilyPCRating

★★★★



*Sound not supported under DOS, NT, or OS/2

CDW - 800 736 4239 • Global Computer Supplies - 800 845 6225 • Inmac - 800 547 5444 • Micro Warehouse - 800 367 7080 • Midwest Micro - 800 413 9856
PC Connection, Inc. - 800 800 5555 • PCs Complete, Inc. - 800 514 4727 • PC Zone - 800 258 2088 • Quill - 800 789 0605 • USA Flex - 800 872 3539

CIRCLE 855 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

PC MARKETPLACE

I N D E X

MORE INFORMATION AND LINKS JUST ONE URL AWAY — When you need more information to make your buying decisions than these ads provide, go to **zdnet Marketplace**. Search a database of hundreds of ads by company, product and/or key words. Vendors can update their prices and product offerings daily. Plus, link to the web sites of advertisers for even more information. (Look for @www. under the ads in this section.) Bookmark www.zdnet.com/marketplace for more ads, more information and links to advertiser web sites.

HARDWARE

	PRIOR CLASSIFIED
Batteries.....	348
Boards/Components/Chips	332...348
Communications	334
Computer Systems	335...351
Input/Data Acquisition/Barcode/POS	338...352
Mass Storage Devices	340
Multi-Media	341
Networking.....	342
Peripherals	342...354
Security	355

SOFTWARE

Barcode.....	356
Business Applications.....	342...355
Business Utilities	343
CD-ROM Titles	343...356
Communications	356
Education	343...356
Entertainment/Games	
Financial/Accounting	345
Internet Tools/Utilities	357
Multi-Media	345

Religion	357
Scientific/Engineering.....	
Security	357
Shareware/Public Domain	345
Adult	366

SERVICES

	PRIOR CLASSIFIED
Data Conversion/Data Recovery	357
On-Line	346...358
Software Duplication.....	359

MISCELLANEOUS

	PRIOR CLASSIFIED
Accessories	347
Business Opportunities.....	355
Supplies	350

MARKETPLACE SALES — 800-825-4237

Andrea Sachs • Patricia Ramez • Janet P. • Lisa Wesley • Janet O'Brien • Rachel Lamy • Bill Hermal •
Midwest x4579 Northeast x3615 Southwest x5112 Northern CA x5118 Southeast x5135 Northwest x3626 Sales Manager x5965

Windows NT 4 Solaris Linux Windows 95 OS/2 PC-DOS SCO UNIX

Win 95 without Risk!

Now you can run both Win 95 and DOS/Win 3.x on the same PC!

If you're considering Windows 95, but have "update phobia", new **System Commander** lets you switch without fear! In fact, you can run Win 95, 3.1, NT, OS/2, and DOS without repartitioning your PC unless you want to... safely, effortlessly and inexpensively.

System Commander:

- prepares your PC automatically for new operating

ing systems in 5 minutes • it's so easy to use - just select the OS you want from the menu and **System Commander** does the rest; reboot and make another selection to use another OS • it saves you money - you need only one machine to run dozens of operating systems!



"Highly recommended!"
John C. Dvornik
PC Magazine



April 1996 Jan 7, 1997

SYSTEM COMMANDER

is only \$99⁹⁵
and comes with an unconditional 60-day money back guarantee.

Get **FREE** overnight shipping* when you mention this ad.

Call today, have it tomorrow!*

800-648-8266
www.v-com.com

Look for System Commander in the Utilities section of most major software stores

V Communications, Inc. • 4320 Stevens Creek Blvd. #120-PCM7 • San Jose, CA 95129 • (408) 296-4224 • Fax (408) 296-4441

* When ordered before noon PST. No Saturday delivery. Continental US. CA res. add \$7.25 sales tax. Offer subject to change without notice. All logos and product names are trademarks of their respective companies. VISA/MC/Amex ©1997

Windows 3.x DOS/V Windows 95j Warp 4 MS-DOS Linux CTOS

© WWW. OR CIRCLE 751 ON READER SERVICE CARD

www.pearsoned.com

SOLO

OPEN SUNDAYS

WITH PRICES LIKE THESE WHO NEEDS A CLEVER HEADLINE...

185 Hamilton Ave. Haverhill, NJ 07633

MONDAY - THURSDAY 10-7
FRIDAY 10-3
SUNDAY 11-4

888.818.SOLO

Small Office / Large Office Business Machines

HOT DEALS

Panasonic KX-4500
• 1 Yr. Warrant
• 600/1200 DPI
• 512K RAM
• up to 4 MB
• Edge Enhancement Technology
• 2nd Inventory
• One Year Warranty

\$288

TOMORROW 940
ONLINE 940
2ND DAY 940

PRINTERS

DOT MATRIX / INKJET

Panasonic	Canon	EPSON	STYLUS	OKIDATA
2800 2800	300 2800	340 2800	320 2800	320 2800
2800 2800	300 2800	340 2800	320 2800	320 2800
2800 2800	300 2800	340 2800	320 2800	320 2800
2800 2800	300 2800	340 2800	320 2800	320 2800

NOTEBOOK COMPUTER

TOSHIBA

SATELLITE 1100 C15
• Pentium 100 + 640 RAM
• 11.3" Dual Scan SVGA Color Display
• PCMCIA Type III Slot
• Factory Renewed
• 1 Year Warranty

\$1188

SATELLITE 1100 C15
• Pentium 100 + 640 RAM
• 11.3" Dual Scan SVGA Color Display
• PCMCIA Type III Slot
• Factory Renewed
• 1 Year Warranty

\$888

HEWLETT PACKARD

• 12 PPM
• 600 DPI
• Optional Duplexing & Postscript
• Factory serviced
• 1 Year Warranty

\$898

NEW LOW PRICE

LASER PRINTERS

Panasonic	OKIDATA	HEWLETT PACKARD	IBM	LEXMARK
2800 2800	300 2800	340 2800	320 2800	320 2800
2800 2800	300 2800	340 2800	320 2800	320 2800
2800 2800	300 2800	340 2800	320 2800	320 2800
2800 2800	300 2800	340 2800	320 2800	320 2800

TEXAS INSTRUMENTS

• Pentium 100 + 640 RAM
• 11.3" Dual Scan Color Display
• Comfortable Palm Rest
• Factory serviced
• PCMCIA Type II & III Slot
• Win 95, Game Sampler

\$888

TRAVEL MATE 4000
• 4MB RAM up to 40MB
• 11.3" Dual Scan Color Display
• 256K Cache
• 16MB Sound
• 2 PCMCIA Type Slots
• Factory serviced

\$666

TRAVEL MATE 5000
• 4MB RAM up to 40MB
• 11.3" Dual Scan Color Display
• 256K Cache
• 16MB Sound
• 2 PCMCIA Type Slots
• Factory serviced

\$737

IBM LEXMARK

• 12 PPM
• 600 DPI
• Optional Duplexing & Postscript
• Factory serviced
• 1 Year Warranty

\$888

WHY SETTLE FOR QUALITY?

MONITORS

SAMSUNG	EIZO-NANO	Panasonic	HITACHI	PRENCEP	SONY	ViewSonic
1200 2800	300 2800	340 2800	320 2800	320 2800	320 2800	320 2800
1200 2800	300 2800	340 2800	320 2800	320 2800	320 2800	320 2800
1200 2800	300 2800	340 2800	320 2800	320 2800	320 2800	320 2800
1200 2800	300 2800	340 2800	320 2800	320 2800	320 2800	320 2800

SAMSUNG

• Pentium 75
• 16MB + 512KB HD
• 10.4" Dual Scan Color Display
• Factory Serviced
• 2 PCMCIA Type II Slot
• Win 95, DOS 6.22

\$788

TRAVEL MATE 4000
• 4MB RAM up to 40MB
• 11.3" Dual Scan Color Display
• 256K Cache
• 16MB Sound
• 2 PCMCIA Type Slots
• Factory serviced

\$666

HEWLETT PACKARD

• 12 PPM
• 600 DPI
• Optional Duplexing & Postscript
• Factory serviced
• 1 Year Warranty

\$1308

GORGEOUS OUTPUT

COPIERS

Canon	HEWLETT PACKARD	EPSON	SHARP	brother
300 2800	340 2800	320 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800	320 2800

Canon

• 360 DPI
• 4 PPM Color
• 0.27 PPM Color
• 7 Resident Fonts
• Factory Renewed
• 62K Buffer

\$138

ENLARGEMENT & REDUCTION

Canon

• 360 DPI
• 4 PPM Color
• 0.27 PPM Color
• 7 Resident Fonts
• Factory Renewed
• 62K Buffer

\$138

ENLARGEMENT & REDUCTION

SCANNERS

HEWLETT PACKARD	EPSON	SHARP	brother
300 2800	340 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800

Acer

• Pentium 100
• 16MB + 512KB HD
• 10.4" Dual Scan Color Display
• Factory Serviced
• 2 PCMCIA Type II Slot
• Win 95, DOS 6.22

\$788

TRAVEL MATE 4000
• 4MB RAM up to 40MB
• 11.3" Dual Scan Color Display
• 256K Cache
• 16MB Sound
• 2 PCMCIA Type Slots
• Factory serviced

\$666

Canon

• 360 DPI
• 4 PPM Color
• 0.27 PPM Color
• 7 Resident Fonts
• Factory Renewed
• 62K Buffer

\$138

ENLARGEMENT & REDUCTION

FAX & MULTIFUNCTION

Canon	HEWLETT PACKARD	EPSON	SHARP	brother
300 2800	340 2800	320 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800	320 2800
300 2800	340 2800	320 2800	320 2800	320 2800

Hitachi

• Pentium 100
• 16MB + 512KB HD
• 10.4" Dual Scan Color Display
• Factory Serviced
• 2 PCMCIA Type II Slot
• Win 95, DOS 6.22

\$788

TRAVEL MATE 4000
• 4MB RAM up to 40MB
• 11.3" Dual Scan Color Display
• 256K Cache
• 16MB Sound
• 2 PCMCIA Type Slots
• Factory serviced

\$666

Canon

• 360 DPI
• 4 PPM Color
• 0.27 PPM Color
• 7 Resident Fonts
• Factory Renewed
• 62K Buffer

\$138

ENLARGEMENT & REDUCTION

Multipass C1500

• 360 DPI
• 4 PPM Color
• 0.27 PPM Color
• 7 Resident Fonts
• Factory Renewed
• 62K Buffer

\$138

ENLARGEMENT & REDUCTION

Micro Firmware

BIOS Upgrades

EIDE Disk Controllers



Features:

- Large hard drive support - 4 drives up to 8 gigs each
- Plug & Play support for Windows 95
- Support for the newest operating systems and CPUs
- Multi-level password security built in
- None of the disadvantages of overlay software
- Best technical support before and after the sale
- Free lifetime maintenance updates

MAJOR CREDIT CARDS, C.O.D. & PREPAY ORDERS ARE ACCEPTED

UNIVERSITY INSTITUTIONAL & CORPORATE PURCHASE ORDERS WELCOME

1-405-321-8333

Email orders: sales@firmware.com

World Wide Web: <http://www.firmware.com>

1-800-767-5465

CIRCLE 756 ON READER SERVICE CARD



Power Hungry?
come get some..

POWERMASTER ELITE

- INTEL PENTIUM II PROCESSOR 250 MHZ with MMX TECHNOLOGY (Single or Dual Processor)
- 32MB / 250MB : 60NS EDO & SDRAM
- 4.2 GIG LIGHTNING FAST SCSI2 / ATA IDE HARD DRIVE
- MATROX MILLENNIUM II 4MB / 8MB VRAM 3D 64 BIT ACCELERATOR
- 12x - 24x SCSI2 / IDE CDROM DRIVE
- ADVANCE ATX MID TOWER - OR RACK MOUNT CASE

SIREX
Systematically Superior
800-747-3903

The Intel Inside Logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation.

CIRCLE 757 ON READER SERVICE CARD

Are you getting it? Optimum Performance



Keyboard/Video & Mouse Switches

KVS does much more than just switch peripherals. But, with all the products on the market today, which system will be the best solution for your company? Give yourself complete control over your data center and how it's personnel operate.

THE SMART CHOICE IS TRON.



Let experienced technicians take you through the Keyboard/Video Switch maze of vendors and

products. After all, we introduced the technology to you in our Industry Standard Keyboard/Video Switch (KVS) White Paper. Tron uses and test KVS products in our own offices and lab,



Where each vendor promotes their own product, Tron can give you a complete comparison of several products all at once.

Call! for your copy of the
White Paper

TRON
INTERNATIONAL, INC.

(800) 808-4672

Or, download the Keyboard/Video Switch (KVS) White Paper from our internet site: [@tron.com](http://tron.com)

CIRCLE 758 ON READER SERVICE CARD

Taking Command Just Got Easier



NEW! On Screen Management

The AutoBoot Commander 4xP is the state of the art switching system that allows users to access and control multiple computers from a single location. Better still, our new On Screen Management pop-up menus make it simple to name, configure and select your attached servers on the fly.



Easy Expansion for your Growing System

Designed for expansion, the 4xP grows with your installation, saving you time, space and money. Users can ultimately access and control as many as 3000 computers from a single location!

For growing systems with multiple users, the 4xP allows up to four users simultaneous access to any attached computer. Even more users can be added with the use of our expansion options.

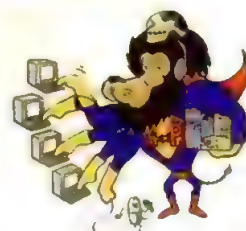
Multiple Platforms

The 4xP is designed from the ground up to support multiple platforms: Mix and match PC, Sun, SGI, HP 9000, Dec Alpha, RS/6000, or Macs -- control them all with a single set of peripherals.

Take Command with the Cybex AutoBoot Commander 4xP!



Cybex Computer Products Corporation
4912 Research Drive Huntsville, Alabama 35805 USA
(800) 93CYBEX (29239) • (205) 430-4030 fax
<http://www.cybex.com>



Cybex, Cybex logo, Commander and AutoBoot are trademarks or registered trademarks of Cybex Computer Products Corporation. PC and RS/6000 are registered trademarks of International Business Machines Corporation. Mac is a registered trademark of Apple Computer Inc. Sun, SGI, HP and Dec Alpha are trademarks or registered trademarks of their respective companies.

See us at Network & Interop. OCT 7 - 9, Atlanta Booth# 254

OR CIRCLE 759 ON READER SERVICE CARD



42ND ST PHOTO

378-5th Avenue, Between 35th & 36th
Street, New York, NY 10018

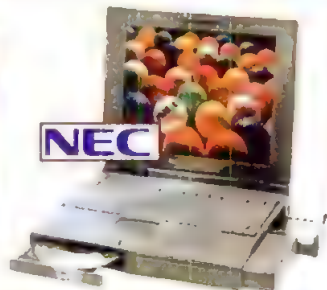
Come Visit us On-Line at:
<http://www.42photo.com>

Local #: (212) 643-8855 Fax #: (212) 643-0608



888-870-4242

Store Hours: Mon-Friday ..9:00am-8:00pm
Sunday.....10:00am-7:00pm



IBM Notebooks

TP365X P133, 8.1/06G, 11.3" DS	Special
TP365XD P133, 8.1/35G, 11.3" DS, 6X CD	1579
TP380D P150 MMX, 16.2/1G, 12.1" TFT SVGA, 8X CD	Special
TP380D P150, 16.1/3G, 12.1" DS SVGA, 8X CD	Special
TP390 P150, 16.1/06G, 12.1" DS SVGA, 8X CD	1989
TP560 P100, 8.8/10, 11.3" DS	1409
TP560 P133, 8.1/06G, 12.1" TFT	Special
TP560 P133, 8.2/1G, 12.1" TFT	Call
TP560 P133, 8.2/1G, 11.3" DS	2299
TP560E P150 MMX, 16.1/2G, 11.3" DS	2899
TP560E P166 MMX, 32/2.1G, 12.1" TFT	Special
TP760E P150, 16.2/1G, 12.1" TFT	Call
TP760E P133, 16.2/1G, 12.1" TFT, 6X CD	Call
TP760EL P120, 8.1/06G, 12.1" TFT	Special
TP760EL P133, 16.1/06G, 12.1" TFT	Call
TP760EL P133, 32/2.1G, 12.1" TFT	Call
TP760XL P166MMX, 32/3.0G, 12.1" TFT, 8X CD	Call
TP760XL P166MMX, 16.2/1G, 12.1" TFT	1699
TP760XL P166MMX, 32/2.1G, 12.1" TFT	Call
TP7650D P166 MMX, 32/3.0G, 13.3" TFT, 6X CD, 28.8k	4799
TP7650L P166 MMX, 32/3.0G, 13.3" TFT, 28.8k	6399

TEXAS INSTRUMENTS Notebooks

EXTENSA 610CD, P150, 16.1/4G, 11.3" DS, 10X CD	Special
EXTENSA 610CDT, P150, 16.1/4G, 11.3" TFT, 10X CD	Special
EXTENSA 650CD, P133, 16.1/35G, 10X CD	1999
EXTENSA 650CDT, P133, 16.2/1G	2299
EXTENSA 660CD, P166MMX, 16.1/35G	Call
EXTENSA 660CDT, P166MMX, 16.2/1G, 10X CD	3399
EXTENSA 900, P133, 16.1/35G, 12.1" DS	2299
EXTENSA 900CDT, P133, 16.1/35G, 11.3" TFT	Call
EXTENSA 900T, P133, 16.1/35G, 11.3" TFT	Call
TM5270 P120, 16.1/2G, 11.3" TFT	1199
TM5370 P133, 16.1/2G, 11.3" TFT	1499
DOCKING STATION, Multi CD Rom w/ 2 extra battery bays	3399
TM6020 P120, 8.8/10, 11.3" SVGA, 28.8k Mod	Special
TM6030 P133, 16.1/35G, 12.1" SVGA TFT, 28.8k	Special
TM6050 P150, 16.1/35G, 12.1" TFT, 28.8k Mod	Special
TM6050T, P150, 32/2.1G, 12.1" SVGA, 10X CD	3799
TM6160 P166 MMX, 32/2.1G, 12.1" TFT, 10X CD	Call
TM7060 P166 MMX, 32/2G, 12.1" TFT, 10X CD, 33.6k	4399
TM7063N P166 MMX, 32/2G, 12.1" TFT, 10X CD, 33.6k	5099

NEC Versa Notebooks

VERSA 2530 P133, 16.1/44G, 12.1" DS	1699
VERSA 2630 CD, P133, 16.1/44G, 12.1" 10X CD	Call
VERSA 2830CD, P150 MMX, 16.1/4G, 12.1" 10X CD	Call
VERSA 2930CDT, P150 MMX, 16.1/4G, 12.1" TFT, 10X CD	2999
VERSA 4080H P120 MHz, 8.1G, 10.4" H-Res TFT	Call
VERSA 6030H P133, 16.1/35G SVGA TFT, 6X CD	Call
VERSA 6030X P133, 16.1/44G, XGA TFT, 6X CD	Special
VERSA 6050MH, P150 MMX, 16.1/4G, 12.1" TFT, 10X CD	Call
VERSA 6050MX, P150 MMX, 16.2/1G, 12.1" TFT, 10X CD	Call
VERSA 6050NT, P150 MMX, 16.2/1G, 12.1" TFT, 10X CD	Call
VERSA 6080MX P166 32/3G XGE 10X CD	5399

Canon Notebooks

INNOVA 360CS Cy133 MHz, 8.8/10, 6X CD R	Call
INNOVA 460DCS, P133, 16.1/06G	1699
INNOVA 490CDT, P133, 16.1/06G	Special

TOSHIBA Notebooks

T110CS P100, 8 EDO/810MB, 11.30STN	959
T205CDS, P100, 8.8/10, 11.3" DSTN, 6X CD	1159
T220CDS, P133, 16.1/44G, 12.1" DSTN, 10X CD, 36.6k	Special
T425CDS, P100, 8 EDO/810, DSTN, 6X CD	1199
T420CDT, P100, 8.8/10, 11.3" TFT, 6X CD	Special
T430CDS, P120, DSTN, 16.1/35 G, 11.3" 10X CD	Special
T440CDT, P120, 16.1/35 G TFT, 10X CD	Special
T440CDX, P133, 16.1/35 G, 12.1" TFT, 10X CD, 36.6k	Special
T440CDX, P133, 16.1/34 G, 12.1" TFT, 10X CD	Special
T460CDX, P166 MMX, 32/2.0 G, 12.1" TFT, 10X CD, 33.6k	Special
T510CDT, P133, 16 EDO/2 G, 12.1" TFT, 10X CD	Special
T650CT, P133, 16.1/2 G, 11.3" TFT	Special
T650CDT, P133, 16.1/2 G, 11.3" TFT	Call
T730CDT, P150, 16/2G, 12.1" TFT, 6X CD	Call
TECRA T500CDT, P120, PCI 16.1/2G TFT, 6X CD	Call
TECRA T500CS, P120, PCI 16 EDO/1.2 G	1999
TECRA T520CDT, P166 MMX, 32/2.1G, 12.1" TFT, 10X CD, 33.6k	Special
TECRA T330CDT, P166 MMX, 32/2.1G, 12.1" TFT, 10X CD, 33.6k	Special
TECRA T720CDT, P133, 16 EDO/2.1G, 12.1" TFT, 10X CD	Call
TECRA T730CDT, P150, 16 EDO/2.1G, 12.1" TFT, 10X CD	Call
TECRA T730CDT, P150, 16 EDO/2.1G, 12.1" TFT, 10X CD	Call
TECRA T740CDT, P166 MMX, 16 EDO/2.1G, 12.1" TFT, 10X CD	Call
TECRA T740CDT, P166 MMX, 16 EDO/3G, 12.1" TFT, 10X CD	Call
PORTEDGE T660CDT, P150 MMX, 16 EDO/1.35G, 11.3" TFT, 10X CD	Call
PORTEDGE T300CT, P133 MMX, 32MB EDO/1.5G, 11.3" TFT, 33.6k	Call
LIBRETTO 50, P75, 16/760, 6.1 Active, 1.85 LBS	Special

Digital Notebooks

H-NOTE VP520 P120, 8.1/1G, 11.3" DS, 6X CD	1899
H-NOTE VP565, P133, 16.1/4G, 12.1" TFT, 12X CD	Call
H-NOTE VP562, P133 MMX, 16.1/4G, 12.1" TFT, 12X CD	Special
H-NOTE VP567, P133 MMX, 16.1/4G, 12.1" TFT, 12X CD	Special
H-NOTE VP575 P166 MMX, 16.2/1G, 12.1" TFT, 12X CD, 34.999	Call
ULTRA II, P133, 16.1/35G, 11.3" TFT, Win95	4599
ULTRA II, P150, 16.1/4G, 11.3" TFT, Win95	Call

AST Ascentia Notebooks

ASCENTIA A60, P150, 16.1/4G, 12.1" TFT SVGA, 10X	2699
ASCENTIA A70, P150, 16.1/4G, 12.1" TFT SVGA, 10X, 33.6k	Call
ASCENTIA F70, P150, 32/2.1G, 12.1" TFT, 10X, 28.8 Mod	Call
ASCENTIA P60, P166, 32MB, 3.0GB HD, 12.1" TFT, 10X, 28.8 Mod	4599

Palmtop's Window CE

CASIOPEIA HANDHELD PC, 2 MB	439
CASIOPEIA HANDHELD PC, 4 MB	459
CASIOPEIA HANDHELD PC, 6 MB	469
COMPAQ PC COMPANION C120, 2MB	Call
COMPAQ PC COMPANION C120+, w/Modem	Call
COMPAQ PC COMPANION C140, 4MB	Call
HEWLETT PACKARD PALMTOP 300LX, 2MB	479
HEWLETT PACKARD PALMTOP 320LX, 4MB	639
NEC MOBILEPRO 200, 2MB	479
NEC MOBILEPRO 400, 4MB	599
US ROBOTICS PALM PILOT PERSONAL	279
US ROBOTICS PALM PILOT PROFESSIONAL	379
PHILIPS VELO	Call

COMPAQ Notebooks

ARMADA 1130 P120, 16.1/08G, 10.4" DS	Special
ARMADA 1130T P120, 16.1/08G, 10.4" TFT	Call
ARMADA 1510DM P120, 16.1/08G, 11.3" DS, 33.6k	Special
ARMADA 1520DM P133, 16.1/08G, 11.3" DS, 33.6k	Special
ARMADA 1530DM P333 MMX, 16.1/4G, 12.1" DS, 10X CD, 33.6k	Special
ARMADA 1550DMT P133, 16.1/4G, 12.1" TFT, 10X CD, 33.6k	Special
ARMADA 1580DMT P150 MMX, 16.2G, 12.1" TFT, 10X CD, 33.6k	Special
ARMADA 4120 P120, 16.1/08G, 11.3" DS	Call
ARMADA 4120T P120, 16.1/08G, 11.3" TFT	Call
ARMADA 4130T P133, 16.1/08G, 11.3" TFT	2399
ARMADA 4150 P150 MMX, 16.1/8G, 12.1" DS	Special
ARMADA 4160T P166 MMX, 16/2G, 12.1" TFT	Special
ARMADA 7710MT P150 MMX, 16.2/1G, 12.1" TFT, 33.6k	Special
ARMADA 7730MT P166 MMX, 32/2.1G, 12.1" TFT	4999
ARMADA 7550MT P166 MMX, 32/2.1G, 12.1" TFT, 1024x768, 5799	Special
PRESARIO 1060 P120, 16.1/08G, 11.3" DS, 6X CD	Special
PRESARIO 1070 P133, 16.1/08G, 12.1" DS, 33.6k, 10X CD	Special
PRESARIO 1075 P150MMX, 16.1/4G, 12.1" DS, 33.6k, 10X CD	Special
PRESARIO 1080 P166MMX, 16.1/4G, 12.1" TFT, 33.6k, 10X CD	Special
LTE 5280 P120, 16.1/3G, 11.3" TFT	3499
LTE 5300 P133, 16.1/3G, 12.1" TFT	3199
LTE 5300 P133, 16.2/1G, 12.1" TFT	5199
LTE 5380 P133, 16.2/1G, 12.1" TFT	Call
LTE 5400 P150, 32/2.1G, 12.1" TFT	Call

Samsung Notebooks

SENS 810 P150, 16.2/1G, 12.1" TFT, 6X CD	2299
SENS 810 P133, 16.2/1G, 12.1" TFT, 6X CD, 28.8k	Special
SENS PRO 520 P150, 48/2.1G, 12.1" TFT, 10X CD, NT	Special
SENS PRO 520 P133, 16.1/4G, 12.1" TFT, 10X CD, NT	Special
SENS PRO 520 P133, 32/2.1G, 12.1" TFT, 10X CD, NT	Special
SENS PRO 500 P120, 16.1/4G, 12.1" TFT	Special
SENS PRO 500 P150, 16.2/1G, 12.1" TFT, 6X CD	2399

HITACHI Notebooks

C-SERIES P133, 8.1/1G, 12.1" TFT, 28.8 Modem	1999
E-SERIES P133, 16.1/1G, 11.3" DS, 28.8 Modem	Special
E-SERIES P133, 16.1/1G, 11.3" TFT	1099
M-SERIES, P120, 16.1/1G, 11.8" TFT, 8X CD	1699
M-SERIES P133, 16.1/1G, 11.8" TFT, 6X CD, 28.8 Mod	Call
MX-SERIES P150, 16.2/1G, 12.1" TFT, 8X CD, 33.6k	Call
MX-SERIES P133, 16.1/35G, 12.1" TFT, 8X CD, 33.6k	Call
VISIONBOOK ELITE P166, 16.2/1G, 13.3" TFT, 10X CD	Special
VISIONBOOK PLUS P133, 16.2/1G, 12.1" DS, 10X CD, 33.6k	Call
VISIONBOOK PLUS P150 MMX, 16.1/4G, 12.1" DS, 10X CD, 33.6k	Call
VISIONBOOK PLUS P166 MMX, 16.2/1G, 12.1" DS, 10X CD, 33.6k	Call
VISIONBOOK PRO P133, 16.1/4G, 12.1" DS, 10X CD	Call
VISIONBOOK PRO P166, 32/2.1G, 12.1" DS, 10X CD	Call
VISIONBOOK PRO P166, 32/3G, 13.3" TFT, 10X CD	Call

HEWLETT PACKARD Notebooks

OMNIBOOK 2000CS, P133, 16.1/4 G, 12.1" DS	2199
OMNIBOOK 2000CT, P133, 16.1/4 G, 12.1" TFT	2799
OMNIBOOK 2000CT, P133 MMX, 16.2/1 G, 12.1" TFT	Special
OMNIBOOK 5500CS, P100, 16.8/10	1359
OMNIBOOK 5500CT, P120, 16.1/3 G, 11.3" DS	Special
OMNIBOOK 5500CT, P133, 16/2G, 12.1" TFT	3650
OMNIBOOK 5500CTS, P133, 16.1/35G, 12.1" TFT	Call
OMNIBOOK 5700CT, P150 MMX, 16.2 G, 12.1" TFT	Call
OMNIBOOK 5700CT, P166 MMX, 16.2 G, 12.1" TFT	4799
OMNIBOOK 800CS, P100, 16.8/10, 10" DS	Special
OMNIBOOK 800CT, P133, 16.1/44G, 10" TFT	Call
OMNIBOOK 800CT, P166 MMX, 16.2/1 G, 10.4" TFT	4299

FUJITSU Notebooks

LIFEBOOK 4200 P120, 16.1/1G, 11.3" DS, 10X CD	Special
LIFEBOOK 4350X, P133 MMX, 16.1/3, 12.1 DS, 10X CD	1899
LIFEBOOK 5200 P100, 11.3" DS, 6X CD	1199
LIFEBOOK 5201 P133, 16.1/3G, 11.3" TFT, 6X CD, 28.8k	Special
LIFEBOOK 531T P133, 16.1/3G, 11.3" TFT, 10X CD, 36.6k	2149
LIFEBOOK 535T P133, 16.2/0G, 12.1" TFT, 10X CD, 36.6k	Special
LIFEBOOK 555TX, P150 MMX, 16.2/3G, 12.1" TFT, 10X CD, 36.6k	3198
LIFEBOOK 555T, P150, 16.1/3G, 12.1" TFT, 6X CD, 28.8k	Special
LIFEBOOK 555T, P150, 16.1/3G, 12.1" TFT, 6X CD, 28.8k	Special
LIFEBOOK 555TX, P166 MMX, 32/2.1G, 12.1" TFT, 20X CD, 36.6k	3998
LIFEBOOK 635T, P133, 16.1/3G, 12.1" TFT, 6X CD, 28.8k	Special
LIFEBOOK 655TX, P150 MMX, 16.1/3G, 12.1" TFT, 33.6k	2995
LIFEBOOK 656TX, P150 MMX, 16.2/1G, 12.1" TFT, 16X, 33.6k	3999

PCMCIA CARDS

PCMCIA Lan 10 Base 1	169
PCMCIA Lan 10 Base 2	169
MPEG Card Zoom Video	199

LINEAR FLASH MEMORY CARD

2 MB	100	10 MB	229	20 MB	Call
4 MB	109	12 MB	299	24 MB	Call

PCMCIA ATA FLASH MEMORY

4 MB	100	20 MB	359	48 MB	599
8 MB	159	24 MB	409	56 MB	799
15 MB	299	32 MB	429	64 MB	899

Digital Cameras Konica

Q-ME DIGITAL	SPECIAL 159.97
D-300L, 640x480, 16.7 Million Color	IN STOCK
NEW D-300L, 1024x768 Resolution	IN STOCK



Kodak DC-260, 35-135, DC-135	199.99 and up
NEW DC-135, 1/2 Million Pixels	CALL
3X Power Zoom with Macro	CALL

COLOR QUICKCAM 640x280	199.99 After Rebate
QUICKCAM 320x240	79.95 After Rebate

RECIE Video Arts, PCE/ISA Slot	549.99
RECIE Video Arts, PCE/ISA Slot	799.99

SONY DCR-PC7	CALL
SONY DCR-VE1000	CALL
SONY DCR-101	CALL

CASIO QV 10A PLUS	179.00 QV-11
QV-10A PLUS	229.00
SHAPPI 2.8 VIDEO SHAPSHOT	139.95 After Rebate

Due to industry price changes, call for current pricing and availability. PRICES AND AVAILABILITY ARE SUBJECT TO CHANGE. 15 day return and exchange. All items returned must be in original packaging and documentation. A minimum 5% restocking fee may apply. Shipping and handling are non-refundable. No returns without RMA number. All printers are not returnable unless defective item. All logos and trademarks are registered trademarks of their respective holders. Prices are valid for Mailorder only. Not responsible for typographical errors. Pictures used for illustration purposes only. We reserve the right to limit quantities. All prices and details in this ad are valid till the end of this month publication date. Prices valid for mailorder only.

Real Hardware.

12.1" Color LCD Monitor • XGA High Resolution • 200cd/m² Brightness

Wide Viewing Angle • Active Matrix • Sealed • 2" Thin • VGA Compatible • 4 Mounting Options

Resistive or Capacitive Touchscreen Option • Multi-Scan 640 x 480 to 1024 x 768



DATALUX

<http://www.datalux.com>

1-800-DATALUX

NOW RENTING.

True 800 x 600 Resolution!

Great Image For Rent

Whether you need lightweight portability, high-resolution, incredible brightness or multimedia, we've got the right tools to make your bright ideas shine!

- ▶ Your rental fee applies towards the purchase of ANY system within 30 days.
- ▶ Convenient "Label & Leave" Pick-Up Service.
- ▶ Every system is tested for Guaranteed Performance!

<http://www.boxlight.com>



Look Bright Overnight! Call:

1-800-736-6954

CIRCLE 705 ON READER SERVICE CARD

ZDNet Marketplace

Location: <http://www.zdnet.com/marketplace>

BOOKMARK THIS

ZDNet Marketplace is a searchable database of hundreds of ads for everything computer related. It's quick and easy to search for the products you need, and direct links to many advertisers' web sites make it easy to get more information. You only need to know one address to check out products and prices available from hundreds of companies.

<http://www.zdnet.com/marketplace>

ZDNet Marketplace™

Siliconex Industrial Computer Systems

Completely Configured Systems
Rackmount System Enclosures
NCR 4/12 Industrial Workstations
Monitor • Keyboard Enclosures
Single Board Computers
3 to 20 Slot Passive Backplane
(Up to 8 PCI slots)

Hot Swap Redundant PS
ATX/AT/14 or 20 PB slots

SR-4000
Passive Pro PCI/ISA Slot

SR-400 ATX
Rackmount Chassis

800-700-8560

<http://www.siliconex.com>
E-mail: info@siliconex.com
Leasing option available
Tel. 408-720-1090 Fax 408-245-2570
All major credit cards accepted.

CIRCLE 762 ON READER SERVICE CARD

The Right Projector at the Right Price!

EPSON ELP-5000

Call for Best Price

True SVGA 1024 x 768
Supports 1280 x 800
2,000 lamp
Only 14 lbs.
450 lumens

**30 DAY
MONEY BACK
GUARANTEE**
100% CUSTOMER
SATISFACTION
GUARANTEED



We'll Help You:

- With the largest selection of leading brands.
- With FREE loaner units overnight.

Lease A Projector For As Little As \$110 Per Mo.!



CTX EzPro 550

Call for Best Price

SVGA (1024 x 600)
Also Available in VGA
Super-ultraportable 9 lbs.
Device carrying case included

Call Toll-Free 1-800-475-1986



Audio Visual Innovations

Your Source For Being Seen And Heard

Ask About Our FREE ABCs of LCDs.

Mon-Fri. 8AM-8PM EST
For More Info Visit <http://www.avinc.com>

We Sell, Rent or Lease All Major Brands!

OR CIRCLE 763 ON READER SERVICE CARD



Digital Camera PC Card Reader/Writers

- Win95, Win 3.x, DOS, Mac and Unix compatible
- PC Card Standard Type 1, 2 & 3
- Read/write on any SCSI system
- SRAM, flash disk, ATA flash, hard disks and compact flash

Phone: 1-800-451-1571 & (408) 379-0770 or Fax: (408) 379-3666
131-D Albright Way Los Gatos, CA 95032



PCD-10 1-slot external reader/writer	\$349.00
PCD-15 2-slot external reader/writer	\$425.00
PCD-15 2-slot internal reader/writer	\$299.00

<http://www.intermartsys.com>

OR CIRCLE 764 ON READER SERVICE CARD

Intel Pentium® Processor Based PC's

"At The Right Price"

Intel Pentium® II processor and Pentium® processor based PC's by MEDIAON™

Every System Features An Intel Motherboard

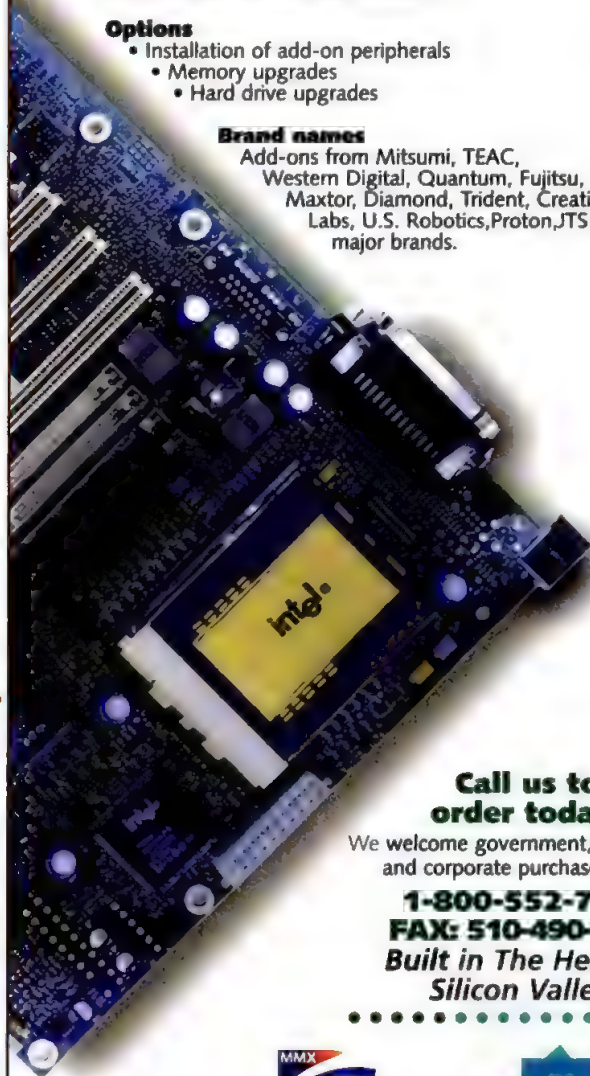
- 2 year parts and labor warranty
- Name brand components
- Fully assembled, tested and burned-in

Options

- Installation of add-on peripherals
- Memory upgrades
- Hard drive upgrades

Brand names

Add-ons from Mitsumi, TEAC, Western Digital, Quantum, Fujitsu, Maxtor, Diamond, Trident, Creative Labs, U.S. Robotics, Proton, JTS and other major brands.



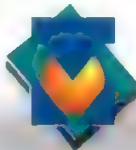
**Call us to
order today!**

We welcome government, educational
and corporate purchase orders!

1-800-552-7835

FAX: 510-490-5261

**Built in The Heart of
Silicon Valley!**



MEDIAON
The Computer Experts™

Check out our website at www.mediaon.com
for latest prices and configurations

Prices and specifications subject to change without notice. MEDIAON™ and The Computer Experts are trademarks of MEDIAON™ Incorporated. The Intel Inside logo and Pentium are registered trademarks of Intel Corp. All other trademarks are properties of their respective owners.

Systems by MEDIAON™**ExpertPro****Intel Pentium®II and Pentium Pro Processor based systems**

- Intel Pentium®II or Pentium®Pro Processor
- Intel PD440FX ATX Motherboard with USB-Pentium II
- Intel VS440FX ATX Motherboard with USB-Pentium Pro
- 32MB EDO Memory
- ATX Mid Tower chassis
- UL/CSA approved 235 Watt power supply
- 24X IDE CD-ROM Drive
- 3GB IDE HD/Teac 1.44 Floppy Disk Drive
- Mitsumi 104 key PS/2 keyboard
- Microsoft PS/2 Mouse
- Microsoft Win NT 4.0 (Pentium Pro)-Win 95 (Pentium II)
- Diamond Stealth 3D 2MB VRAM Video
- Yamaha OPL sound system/80 Watt speakers-Pentium II

180 Pentium® Pro Processor.....	\$1,575.00
200 Pentium® Pro Processor.....	\$1,669.00
233 Pentium® II Processor.....	\$1,759.00
266 Pentium® II Processor.....	\$1,895.00

Expert II**Intel Pentium® processor based system with MMX™ technology**

- Intel Pentium® Processor 133, 150, 166 MHz or Intel Pentium® Processor 200 MHz with MMX™ technology
- Intel TC430HX ATX motherboard w/built-in Sound, 512K Pipeline Burst Mode Cache, and USB
- ATX Mid-tower chassis with 235 Watt UL approved P/S
- 16MB EDO memory
- 16x CD-Rom Drive/80 Watt Speakers
- 2GB IDE HD/Teac 1.44 Floppy Disk Drive
- Mitsumi 104 keyboard/MS® PS/2 Mouse
- S3 3D 2MB Video (Upg. to 4MB)
- Microsoft Windows 95 CD-Rom

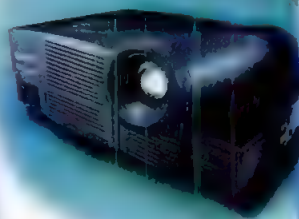
133 Pentium® Processor\$899.00

150 Pentium®Processor.....	\$919.00
166 Pentium®Processor.....	\$959.00
200 Pentium®Processor.....	\$1,039.00
166 Pentium®Processor w/MMX™technology.....	\$1,069.00
200 Pentium®Processor w/MMX™technology.....	\$1,189.00
233 Pentium®Processor w/MMX™technology.....	\$1,345.00



"Monitor sold separately"

PROUD SPONSOR OF
SILICON VALLEY BUSINESS
THIS WEEK
AS SEEN NATIONALLY ON
KNOWLEDGE TV



Boxlight 2002

Equipped with easy-to-use features.

- 300 Lumens
- Built-in audio
- SVGA 800 x 600
- Weight 16lbs.

\$4,399

*Business Lease \$139/mo



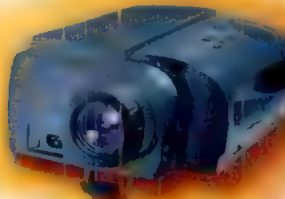
Revolution 3000

The first sub-compact SVGA projector with the quality of polysilicon.

- A portable 14 lbs.
- Full SVGA 800 x 600
- Optional big-screen TV tuner

\$4,999

*Business Lease \$159/mo



Revolution 3700

The new standard for portable multimedia performance.

- 450 ANSI, true SVGA
- Weight 12lbs.
- 3-LCD Polysilicon
- Zoom, Auto-Setup

Call for price

*Business Lease \$261/mo



Boxlight 2020

The first mobile projector built to survive frequent travel.

- True 800 x 600 SVGA
- "Fold-away" design
- Audio/Video/Data
- Only 11 lbs.

Call for price

*Business Lease \$129/mo

**Technology makes it possible;
Boxlight makes it easy.**



Let us do the work for you.

When you're ready to rent or buy the latest presentation technology, look to Boxlight. We have searched all over the world for the finest hardware available and can supply you with the best equipment to meet your needs and budget. We "pre-shop" the entire industry to pick the highest value products from such trusted manufacturers as Infocus, Proxima, nView, Panasonic and Sanyo. And because we buy in volume, we can offer the best prices you'll find anywhere.

**ASK US
ABOUT
RENTALS**

It's as easy as 1,2,3.

You begin by discussing your needs with our team of presentation experts. When you've agreed on the best solution, it will be delivered directly to your office as early as the next day. You connect it to your PC, and it is ready to run—projecting full-color images onto a big screen.

We support your purchase with our superior package of services, from extended warranties and upgrade programs to free technical support.

It's what we call—"Boxlight Certified." It's what you'll call—satisfaction!

Buy with confidence.

Every Boxlight product has a 30-day money-back guarantee—period. We can make that promise because we select products that meet our demanding standards for image quality, ease-of-use and reliability. Through field trials and continuous quality inspections, we ensure that you get the best products the industry has to offer.



CALL US NOW AND WE'LL START WORKING FOR YOU TODAY

1-800-216-3396

Government: 800-497-4009
Resellers: 800-736-6956
International: 360-779-7901

Rental: 800-736-6954
Fax: 360-779-3299
Education: 800-689-6676

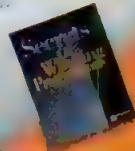
BOXLIGHT™
CORPORATION

Monday - Friday 6am-5pm PST. Purchase orders accepted w/0 A/P. Prices subject to change. Quantities may be limited to stock on hand. 30-day money-back guarantee does not apply to Resellers and special orders. *Business lease is 36 month FMV lease requiring first and last month's payments at lease inception. Price does not include sales tax. Call for complete details. 11/97



<http://www.boxlight.com/pcmag/>

BOXLIGHT



Call now for your FREE Boxlight guide!



Today's Storage

PD isn't just a high-capacity, removable storage solution... By utilizing **rewritable** DVD technology, it's designed with the future in mind. That's why manufacturers of advanced systems like Compaq's Deskpro and the IBM PC 365 model 14U include the PD.

They know PD gives their users the features they need:

- A whopping 650MB of storage on a single, rewritable disk
- Unlimited storage for about 4.5¢/MB—just add another disk
- Rugged, reliable storage that isn't affected by head crashes, stray magnetic fields, harsh environments, or rough handling
- Easy storage of video, audio, graphics, and Internet files
- Unlike CD-R, PD media is **rewritable**
- PD media has a data life of 30+ years



Compaq Deskpro with PD Drive

- And, they'll be able to read their PD media with future Panasonic DVD-RAM drives

Use it for low-cost, reliable storage of desktop publishing work, prepress production files, multimedia development, Internet file downloading, and backing up your system.

The versatile PD also plays your CD-ROMs, CD-R, photo-CDs and even audio CDs...flawlessly.

PD, the 650MB **rewritable** optical drive with economical, easy to use, removable media *and* built-in CD-ROM.

For the storage solution that meets your needs today and tomorrow, visit the Compaq, IBM, Panasonic web sites; or call us for the name of the authorized PD dealer nearest you.



IBM PC 365 Model 14U with PD Drive

MAC SUN UNIX DOS WINDOWS AIX OS2

Your Tape Connection Source

- ✓ Mainframe ↔ PC
- ✓ Tape ↔ CD
- ✓ Data Exchange/Backup
- ✓ Data Conversion
TAR, CPIO, VMS SAVES, L, ASCII, EBCDIC
- ✓ 1 year Onsite Warranty

Featuring FUJITSU Quality Products



Computer Peripherals Unlimited Inc.
2355 N. Steves Blvd., Suite C • Flagstaff, AZ 86004
(602) 396-3616 Phone • (602) 396-0483 Fax

3480 3490 3490E 9-Track 8mm 4mm

CIRCLE 768 ON READER SERVICE CARD

Custom ULTRA SCSI Tools

SCSIVue Active Terminator \$59

- Improves SCSI Bus Performance
- Less Errors, More Reliable Data Transfer
- Diagnoses Problems • Analyzes Signal Quality
- Active Regulation • Fast 50 & Fast Wide 68
- Status Indicators • Gold Contacts

Diagnostic Adapters

- 68 Pin Drive to 50 Pin IDC (runs wide drive as narrow)
- 68 Pin External Adapter to 50 Pin (converts Host Adapter)
- Gender Changers both 50 and 68 pin (all combinations)
- Adaptable with parallel termination for 68 to 50 conversions

Ultra SCSI Cases & Accessories



SCSIVue Gold Cables \$39

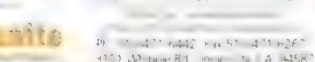
- Triple Shielding (Unique Design)
- Double Gold 20u" Plated Connectors
- Diagnostic Indicators • Large Ferrite Filters
- Extra Heavy 26 Gauge Wire • 100 Styles in Stock

Custom Teflon® Internal Cables

- Less Errors, Ultimate Performance
- Silver Wire Improves Signal Quality
- Perfect 90 Ohm Impedance • Custom in 1 Day
- Triple Pronged Connector • Gold contacts Silver Wire

SCSI Cable Tester - LED Readout

- This Digital SCSI Cable Tester can test all nine popular cable styles for opens, shorts, and unreliable operation. Battery powered for easy use



CIRCLE 769 ON READER SERVICE CARD

SPEED. CAPACITY. CONNECTIVITY.



AND DID WE MENTION RELIABILITY?

- DLT - Award-winning, high-capacity, high-performance tape drives & libraries

Store 15 GB - 400 GB/system
Backup up to 5 GB/hr

- Half-inch cartridge high-performance IBM compatible solutions

Exclusive 18 & 36-track read and write in one drive
10 GB/hr transfer rates

- 9-track interchange systems for fast, dependable mainframe to PC data interchange

Call today for the most cost-effective data storage solutions available

1-800-729-8725 or
619-571-5555

<http://www.overlanddata.com>



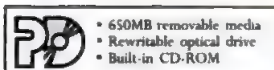
OVERLAND
DATA

DRIVING THE INDUSTRY

CIRCLE 767 ON READER SERVICE CARD

Solution For...

Tomorrow's Technology.



COMPAQ
www.compaq.com

IBM
www.ibm.com

Panasonic
(800) 742-8086 Ext. PD
www.panasonic.com/alive

© 1996 Panasonic. All rights reserved. The IBM logo is a registered trademark of International Business Machines Corporation. The Compaq Designo and Compaq Logo are registered trademarks of Compaq Computer Corporation. All other copy rights or trademarks are property of their respective owners.

Ref PD-8

OR CIRCLE 770 ON READER SERVICE CARD

Make the Connection

Featuring D-Link networking Products

Adapters, switches, hubs, routers, ...All your networking product needs from the company with the
"Commitment to Connectivity"
are now available at internet-direct prices

ibuydirect.com

Presentation Products from Setec

Remote Wireless Mouse with Laser Pointer and
Screen Annotation Software, PC-to-TV Converter,
and Data-grade 29" Presentation Monitors

http://www.ibuydirect.com



CIRCLE 771 ON READER SERVICE CARD

DOS • WINDOWS • 95 • NT • OS/2 • UNIX



East-800-828-0599
West-800-928-9099

**Data Interchange
& Storage Expert**

Headquarters—Chi Corporation
30275 Bainbridge Rd, Suite 2A
Solon, OH 44139
216 349 8605 Fax 216 349 8609

Phoenix Office—Chi Corporation
10640 North 28th Dr., Bldg. C205 Suite 21
Phoenix, AZ 85029
602 548 9010 Fax 602 548 9041

Nine Track Tape Systems

All Densities—800/1600/3200/6250

All Platforms

3480/3490/3490E/3590

compatible
Single Load or 10 or 60
cartridge Libraries

DLT—4mm—8mm

Complete Network backup
Solutions—Novell, NT, Unix
Libraries by ADIC

DataConversion Services

4mm, 8mm, 9trk, 3480, 3490,
3490E, EVEN TO CD

CD ROM Recorders

2x/6x, 4x/6x,—All platforms
Media Form CD duplication systems

CD ROM Jukeboxes

NSM, SONY, JVC, Pioneer, Cygnel

Chi Corporation: Manufacturers of the
Award Winning OutRight and ReelView II Software

CD ROM Jukebox

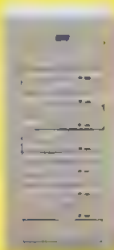
For Novell or NT Software by Smart Storage

CHI 828

28 Disk capacity with 7-8x CD ROM Readers
Includes all necessary software, cables, SCSI card

Also Available in other configurations

816 - 16 slot, 4-8x readers 8-20-20 slot, 5-8x readers
8-24-24 slot, 6-8x readers 8-25R-25 slot, 6-8x readers
One Yamaha 4x recorder, Gx reader



www.chi corporation.com

CIRCLE 772 ON READER SERVICE CARD

Marketplace One link to hundreds of ads. Plus links to the Web Sites of... www.who.com

Breakthrough

In Keyboard Monitor Switch



Multi Platform & On-Screen Display

BREAKTHROUGH the clutter of multiple keyboards, monitors, and mice with this latest **INNOVATION** from Rose. This switch has every feature you asked for:

- Switches several servers or computers to a single monitor, keyboard, and mouse
- Supports any mix of PC, Apple, Sun, RS 6000, HP 700 series, DEC Alpha, SGI, or other computers from any keyboard or mouse
- Front panel has keypad for easy selection of computers and configuration
- Front panel display shows computers name and other information
- Command to switch can come from keyboard, front panel, or RS232 port
- Simple to use keystrokes switch computers for fast and easy control

Built in daisy-chaining supports up to 256 computers

Flash memory for future upgrade of features

Easy to use **OverView™** system gives control and status with on-screen graphics

Many other features!

CALL FOR A FREE CATALOG:

- Keyboard/Video Control
- Print Servers
- Data Switches

800-333-9343

VISIT OUR WEB SITE AT WWW.ROSEL.COM



ROSE ELECTRONICS

10707 STANCLIFF ROAD HOUSTON, TEXAS 77099 Tel. 281-933-7673 Fax 281-933-0044
CIRCLE 773 ON READER SERVICE CARD

TAKE Control

of 2 to 64 computers



MasterConsole

Managing Multiple Servers?

Save time, space and money! Raritan's MasterConsole will give you rock-solid, reliable control of all your systems—**PCs, Macs, Suns**—from a single keyboard, monitor and mouse. Tens of thousands of organizations rely on MasterConsole every minute of every day. So can you!

“We've installed hundreds around the world. They just don't break. Nothing else compares.”

Don Deamond
President
Advanced Networks

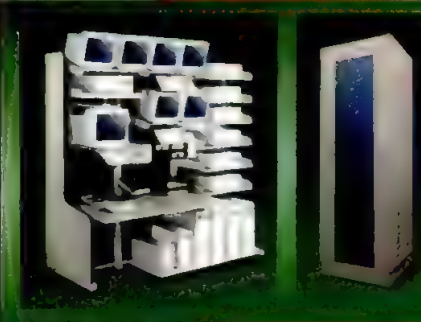


Raritan (800) RCI-8090 x41

Raritan Computer, Inc. E-mail: sales@raritan.com Tel. 908.764-8886
400 Cottontail Lane, http://www.raritan.com Fax 908.764-8887
Somerset, NJ 08873

See us at **NETWORLD/INTEROP ATLANTA, OCTOBER 8-10 Booth #6112**
CIRCLE 774 ON READER SERVICE CARD

COMPUTER RACKS & ENCLOSURES



HERGO
A VARCO STORE

WWW.HERGO.COM
888-222-7270

CIRCLE 775 ON READER SERVICE CARD

STOP Production Dust From Getting Into Your Computer Equipment

The **DUSTSHIELD** is used by hundreds of companies to prevent the damage and downtime that occurs when airborne contaminants get into computer equipment.

The **DUSTSHIELD** utilizes a unique two stage fan filter system to create an ultra clean positive pressure environment.

DUSTSHIELDS are easy, effective and affordable. Access to Drives, etc is unhampered. Custom Made for CPUs, Monitors, Servers, Workstations, Laser Printers and many others.

ENVIROSAFE TECHNOLOGIES
1-800-888-7452
Jax, FL • Fax 904-646-3575
WebSite: <http://www.dustshield.com>

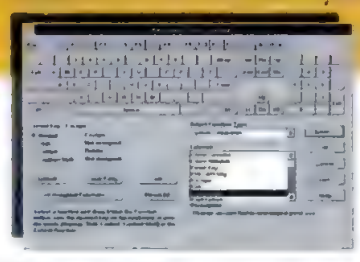


DS 850—CPU, Monitor & Keyboard

WWW. ON CIRCLE 776 ON READER SERVICE CARD

Distinct IntelliTerm™

Integrated Terminal Emulator for DEC and IBM® Systems



Highlights:

- TN3270 Emulation—Models 2,3,4 and 5 (for IBM Mainframes)
- 31796 Vector Graphics & 3279S36
- TN5250 (24x80, 27x132) (for AS/400)
- VT52, VT100, VT220, VT320 & VT420 emulation (for DEC and UNIX Systems)
- Customizable keyboard layouts, poppads and session profiles
- VBA™ Advanced Scripting Language
- DDE, HLLAPI, EHLLAPI, WinHLLAPI and Visual Basic™
- Available for Windows 3.11, Windows 95 and Windows NT

distinct
The world leader in Internet development tools.

408.366.8933
WWW: <http://www.distinct.com>
Fax: 408.366.0153
E-mail: pcmag@distinct.com
Fastfacts: 408.366.2101

Distinct is a registered trademark and Distinct IntelliTerm is a trademark of the Distinct Corporation. Copyright 1996 Distinct Corporation. 15000 Varapack Avenue, San Diego, CA 92127. IBM and Windows are registered trademarks of the respective corporations. All rights reserved. Specifications and terms are subject to change without notice.

CIRCLE 777 ON READER SERVICE CARD

DocMan™ for Windows® 2.0

The Ultimate Document Filing System for Your PC!

- Manage both scanned documents and documents created with most applications.
- Organize your documents using the same filing system you do now; file rooms, filing cabinets, file drawers, folders/sub-folders, documents. No need to learn a new filing system!
- 32 BIT Power for Superior Performance!
- Designed for Windows 95/NT!
- Network Ready Out of the Box!
- Award Winning OCR Included!
- Full-Text Indexing.
- Transfer File Rooms to CD-Rom with DocMan CD-Creator.
- Batch Scanning for High Volume Users!
- Fast File/Fast Find Modules!

Imaging Magazine says, "The interface...once mastered, it's logic becomes elegant."

Download a working demo from
www.docusoftinc.com

DocuSoft®

4036 Ole Miss Drive, Kenner, LA 70065

Toll Free Order Line

Information/Customer Service

Internet:

E-mail:

(800) 669-7018

(504) 467-3863

www.docusoftinc.com

ssmail@msn.com

Prices Starting from \$199.95
30 Day Money Back Guarantee!



CIRCLE 778 ON READER SERVICE CARD

CD-ROM WHOLESALE

BUY 2 GET 1 FREE

FORBIDDEN KNOWLEDGE
The Computer Underground II: SECRETS OF THE PHREAKS AND HACKERS ARE LAID BARE!

MORE WITH WARCRAFT 2
Thousands of additional items, including some levels, the WARCRAFT II The Final Computer Collection!!

COMMAND & CONQUER
More levels for Command & Conquer and Red Alert! Includes a bonus CD-ROM!

Please send Check or Money Order to:
Software Solutions
4490 Chesswood Dr. #3
Toronto, Ontario
M3J 2B9 CANADA

14.95 each
plus 4.95 shipping & handling

To Order Call:
1-416-638-4411
Fax Orders: (416) 638-4477

IMAGE LIBRARY
Over 4000 images in 41 categories. The best clipart on the market!

The WEB
Thousands of clipart, J-pics, animated gifs, backgrounds, icons, etc.

PUBLISHER DREAM CD-ROM
Every utility, program, tool, font, clipart, & images for desktop publishing imaginable!

HACKERS UNDERWORLD
Combination of Forbidden Knowledge CD-ROM, more of the best hacking information, password, credit card fraud info, virus creation & tools used by the expert hackers.

CHILD CD-ROM
Best set of children's CD-ROMs & games out there! Age 2-10. Kids love this!

MUSIC LIBRARY
Packed!! 500 meg of midi, wav, voc, editors, vocs, & sound clip collections.

200 more titles ON THE INTERNET
www.bestcd.com/cd-rom

CIRCLE 780 ON READER SERVICE CARD

ADDRESS FOR SUCCESS

<http://www.aics.edu>

Welcome to the AICS Virtual Campus

- Earn B.S. and M.S. in Computer Science
- DISTANCE EDUCATION
- Object oriented B.S. program
- New courses in Java, Networking, HTML, MIS
- Approved by more than 275 companies
- Follows ACM/IEEE guidelines
- Thousands of students throughout U.S.

AMERICAN INSTITUTE OF COMPUTER SCIENCES

ACCREDITED MEMBER

Free catalogue 1-800-767-AICS
or <http://www.aics.edu>

Keep your PCs up & running with the 100% accurate fix...



Micro-Scope is a universal PC diagnostic that runs a proprietary O/S which eliminates DOS limitations and inaccuracies. Version 6.16 adds 25 enhancements and includes: IDE low-level format, accurate IRQ conflict display, cache memory test, 64 meg video memory test, data recovery capabilities, virus capabilities and super-fast hard drive testing.

Post-Probe is a universal P.O.S.T. (Power-On Self-Test) reader card for the "dead" PC. Post-Probe includes: MCA adapter, tri-state logic probe, 13 LED pre-POST test, 2-digit POST code display and a manual with a full explanation of the manufacturer POST codes down to the exact device or chip failure.

Micro 2000, Inc.
1100 E. Broadway, 3rd Floor
Glendale, CA 91205
Toll Free 1 (800) 864-8008
Fax (818) 547-0397

<http://www.micro2000.com>



©www. OR CIRCLE 778 ON READER SERVICE CARD

NEW! Your PC knows Spanish

... and French, German and Italian. With **Globalink Power Translator® 6.0** it's easy to translate documents, e-mail, Web pages and more.

- Four languages in one box—Spanish, French, German, and Italian to/from English
- Translation utility lets you translate e-mail on-the-fly
- Includes a special version of Globalink Web Translator™
- Install as a menu item within Word
- Create, modify, and prioritize dictionaries to suit your business

For Windows 95 or NT systems

Call 800.837.2095, ext. 8006

for more information or the retail location nearest you.



<http://www.globalink.com>

©Copyright 1997 Globalink Inc. All rights reserved.



CIRCLE 781 ON READER SERVICE CARD

Get Certified!



MCSE

6 Study Guides

6 CD ROMs

\$ 249.95

Covers Windows NT 4.0

A+ Certification

\$ 259.95

• 3 Books

• 2 CD ROMs

Novell CNE 4.11 \$ 349.95

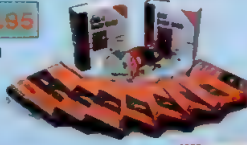
7 Videos for NetWare/IntranetWare 4.11

2 Novell Press Study Guides / 3 CDs

www.lantell.com

800-526-8355

16250 Ventura Blvd # 202 Encino CA 91436 818 905-1262 Fax 905-1292



CIRCLE 782 ON READER SERVICE CARD



Training Videos for Windows Software

KEYSTONE LEARNING SYSTEMS CORP.

Microsoft
SOLUTION PROVIDER



Dan Balter
Microsoft MCSE &
Windows NT Instructor



Dennis Taylor
Microsoft Excel Specialist
& Excel Instructor



Dawn Bjork
Microsoft Certified
& Word Instructor



Alison Balter
Microsoft Certified Developer
& Access Instructor

Windows NT 4.0*

Sec. Ad. Lev. 1-2 (ea) \$89.95
Covers Exam 70-67
Entrp. Ad. Lev. 1-2 (ea) \$89.95
Covers Exam 70-68
Special All Four \$329.95
Sec. & Wk. Install \$89.95
Covers Exam 70-63 & 70-73
Workstn. Admin. Lev. 1 \$89.95
Workstn. Admin. Lev. 2 \$89.95
Workstn. Admin. Lev. 3 \$89.95
Special All Four \$329.95
Covers Exam 70-73
Workstn. User Level 1 \$49.95
Workstn. User Level 2 \$49.95
Both Admins \$89.95
Special All Ten \$669.95



Average 8 hours per video

Excel 97*

Beginning \$49.95
Intermediate \$49.95
Advanced \$49.95
Power Features \$49.95
Pivot Tables \$49.95
Shortcuts & Ideas \$49.95
Special All Six \$239.95

Project 4.1*

Level 1 \$89.95
Level 2 \$89.95
Level 3 \$89.95
Level 4 \$89.95
Special All Four \$289.95

Exploring 3.x

Internet Explorer \$49.95

Message Mail 3.x

Netscape Navigator \$49.95

*Other versions available
Courses may vary, call for pricing

Word 97*

Beg./Int/Adv. (ea) \$49.95
Special All Three \$129.95
Desktop Publishing \$49.95
Mail Merge \$49.95
Tables & Forms \$49.95
Internet \$49.95
Special All Seven \$279.95

Windows 95*

Beg./Int/Adv. (ea) \$49.95
Special All Three \$129.95
Networking \$49.95
Installation \$49.95
Special Features \$49.95
Special All Six \$239.95



Office 95*

Beg./Int/Adv. (ea) \$49.95
Special All Three \$129.95
Developer Lev. 1-6 (ea) \$89.95
Special All Six \$449.95
Free Book & CD w/Dev. set
1 Month Perfect 7
Beg./Int/Adv. (ea) \$49.95
OTP/Mail Mrg. (ea) \$49.95
Tables & Forms \$49.95
Special All Six \$289.95

Over
450
Titles

Domestic Shipping 7 Days \$5.00 for
the first day videos
plus \$1.50 for
each additional
order video



Special MS Office 97 Video Combinations

MS Office 97 Plus (16 videos/29 hours)\$579.95 (with KeyNotes \$749.95)
MS Office 97 Pro (13 videos/24 hours)\$495.95 (with KeyNotes \$639.95)
MS Office 97 Standard (9 videos/17 hours)\$349.95 (with KeyNotes \$469.95)

Special MS Office 95 Video Combinations

MS Office 95 Plus (16 videos/29 hours)\$579.95 (with KeyNotes \$749.95)
MS Office 95 Pro (13 videos/24 hours)\$495.95 (with KeyNotes \$639.95)
MS Office 95 Standard (9 videos/17 hours)\$349.95 (with KeyNotes \$469.95)

Special Corel Office Video Combinations

Corel Office Professional 7 (16 videos/29 hours)\$579.95
Corel WordPerfect 7 Suite Pro (13 videos/24 hours)\$495.95
Corel WordPerfect 7 Suite Standard (9 videos/17 hours)\$349.95

4 Easy Ways to Order.

CALL ▶ 1-800-775-5925
801-375-8680
FAX ▶ 1-801-373-6872
WWW ▶ www.klscorp.com
MAIL ▶ Keystone Learning Systems Corp.
2241 Larsen Parkway • Provo, UT 84606

NOV PM07

We accept C.O.D., Company P.O. or check. +

OR CIRCLE 783 ON READER SERVICE CARD

GET MCSE, CNE OR A+ CERTIFIED... FAST!

The first 100% Computer Based Training (CBT) programs on CD-ROM to fully prepare you for Novell's CNE, Microsoft's MCSE and the A+ Certification exams. ForeFront's Self-Study Courses give you flexibility and portability unmatched by traditional training methods. You'll study at your own pace using our easy to follow, step-by-step format. Study whenever and wherever it's convenient for you!

- All on one CD
- Interactive simulations for hands-on exercises
- Study at your own pace
- Hundreds of practice questions
- Priced below competitive products
- Everything you need to prepare for the exams!

The ForeFront CNE Self-Study Course™

Provides fast, effective and convenient training to anyone wishing to become a Certified NetWare Engineer, even when hampered by a busy schedule. Our CNE CBT allows you to learn everything you'll need for full NetWare certification.



Bonus!!!

Buy Any Two CBTs and
get The Micro House
Technical Library™
FREE

The ForeFront MCSE Self-Study Course™

Ensures the highest rate of retention so that when you complete your training you'll be fully prepared to pass your MCSE exams. You'll be ready and confident to go into the workplace to effectively plan, implement, maintain and support information systems in a wide range of computing environments, using Windows NT and other Microsoft Server products.



The ForeFront A+ CERTIFICATION Self-Study Course™

Getting A+ Certified will help open the way to further advancement in the corporate world. A+ Certification is the new required standard for PC Repair Technicians. This hands-on self-study course will give you all the technical material, knowledge, interactive exercises, and confidence you'll need to pass your exams and excel in today's competitive PC repair marketplace!



Call for Special Discount Pricing Today!

1-800-475-5831

(813) 724-8994 • FAX (813) 726-6922 PM

25400 U.S. Hwy. 19 N., #285 Clearwater, FL 33763



- Free Technical Support
- Next Day Shipping
- Performance Guaranteed



CIRCLE 784 ON READER SERVICE CARD

COMPUTER CHECKS

Laser/Inkjet

Continuous Checks and Check Savers Also Available

As Low as \$29.⁹⁵

CALL: 1-800-239-4087

FAX ORDERS: 1-800-774-1118

(PLEASE CALL FOR A FAX ORDER FORM)

MC, VISA & AMERICAN EXPRESS ACCEPTED

Internet: <http://www.hotnew.com/checks/>

E-Mail: info@checks.hotnew.com

- ✓ QUICKEN
- ✓ SIMPLY MONEY
- ✓ MICROSOFT MONEY
- ✓ MANY MORE

Laser and Continuous Feed

Checks available in:

- Business Size
- Business Size with Voucher
- Wallet Size

Available in Quantities of 250, 500, 1000 and 2000.
Choose From 4 Stylish Colors!

Classic Blue Tan Classic Green Prestige

Designer
CHECKS

PO7D0106 • PC MAGAZINE

CIRCLE 785 ON READER SERVICE CARD

The Best Accounting for the Best Businesses!

Designed to automate your business, U.A. Corporate Accounting™ is the most powerful customizable accounting software available today!

Accounts Receivable
Accounts Payable
General Ledger
Order Entry
Payroll
Inventory
Job Costing
Purchase Order

Unlimited Access
to Your Information!

Completely customizable using Microsoft Access, the U.A. Corporate Accounting system is a virtual part of the Microsoft Office suite. 32-bit software designed for Microsoft Windows 95, Microsoft Windows NT™, Microsoft SQL Server™.

UA
Corporate
Accounting

1-800-859-8807

Phone (504)851-6600

Fax (504)851-6007

Advanced Software Development Corp.

CIRCLE 786 ON READER SERVICE CARD

Retail Accounting without the hassles!

Bar Code Scanning . Inventory Management

NO
Accounting
Knowledge
Needed



Way to
Manage your
Business

Try the Award-Winning & #1 Selling
POS Software for only:

\$599
Limited Time
Offer

30 Day
Satisfaction
Guaranteed



(800) 672-7470
<http://www.targetsoftware.com>

WWW.CIRCLE 787 ON READER SERVICE CARD

Links LS

1998 Edition

THE **ART**
and the
SCIENCE of
GOLF



Introducing the Links LS 1998 Edition. The forces of art and science have combined to produce a golf experience like never before.

This new version of the Codie Award winning golf simulation is packed with over 25 new features! Here's just a few:



Actual Links LS '98 screen capture

- lightning-fast redraws, main view in a window capability, and up to 8 additional "smart" camera views.
- new water reflections, improved textures and enhanced sky backgrounds
- waving flags, birds, airplanes and other background animations with up to 8 of your friends over expanded internet play!



ACCESS
SOFTWARE INCORPORATED

Phone Toll-Free 800.800.4880 • Fax 801.359.2968
Website: <http://www.AccessSoftware.com> Available for the PC

WWW.CIRCLE 788 ON READER SERVICE CARD

Finally! Windows 95 and Macs Share Files and Printers Both Ways

Workgroups and small offices can now operate as efficiently as an enterprise with **PC MACLAN for Windows 95**. Low cost, plug and play installation, Network Neighborhood and long file name support, are just a few of the features that make sharing files, volumes and printers between Macs and PCs a snap.

"For peer-to-peer networking . . . **PC MACLAN 6.0 is the only choice.**"

Macworld Nov '96

Create your own network or complement almost any pre-existing LAN. Sharing information between Windows 95 and Macintosh users is as easy as working off your local hard drive. Print jobs go to the printer of your choice regardless of its location on the network.



For ordering or information:

800-862-2826

e-mail: sales@miramarsys.com

Web: www.miramarsys.com

Miramars Systems, Inc.

Please visit us at:
MacWorld Boston Booth #460

WWW.CIRCLE 789 ON READER SERVICE CARD

PREMIER
Marketplace

● www.CIRCLE791 ON READER SERVICE CARD

CIRCLE 794 ON READER SERVICE CARD

OR CIRCLE 790 ON READER SERVICE CARD

CIRCLE 792 ON READER SERVICE CARD

● **www.** OR CIRCLE 793 ON READER SERVICE CARD

Web Hosting \$16.95

Masterpiece Web Creations

E-mail Accounts
Domain Name Registration
(www.YOURNAME.com)
Site Design and Assistance
Free Page Sponsor
Database Connection
Access to Secure Server
Credit Card Transaction Hosting

No Minimum Contract
Resellers get HUGE discounts!

Reiter Associates, Inc. www.reiterassoc.com
1-800-203-5767 email: sales@reiterassoc.com

CIRCLE 795 ON READER SERVICE CARD

PUT YOUR PAGE ON THE WEB!

WEB HOSTING \$19.95

Per Month*

- Unlimited E-mail Forwarding
- Domain Name Registration http: (www.your_company.com)
- 1000 MB of Data Transfer per Month
- 50 MB Storage for html Documents and Graphics
- Full Redundant T3
- Tons of Web Tools and Wizards
- Real Time Reporting on Web Site Activity
- Support for Custom CGI Scripts
- Support for MS FrontPage 97
- Self Directed Control Center™
- Resellers Welcome

SLIP.NET

* Minimum contract, \$20 setup required

1-800-SLIP.NET www.slip.net Order OnLine!

OR CIRCLE 796 ON READER SERVICE CARD

3 Months FREE

expires July 31

www.9netave.net

981 Origin 2000 Servers
Complete site statistics
Broadband connection via VUuser
Professional site design services
Oracle based search engines
Virtual store construction
SSL secure servers
Old fashioned customer service

WEB HOSTING \$14.95

1 888 9NET AVE 1 888 963 8283

9NETAVENUE

OR CIRCLE 797 ON READER SERVICE CARD

Is your business on the Internet?

1-800-749-1706

World Wide Web

Commercial Virtual Hosting Services

- 40 MB of disk space for your html & graphics (\$0.50 per MB over 40 MB)
- 500 MB Data transfer per month (\$0.12 per MB over 500 MB)
- FREE! Support for custom CGI scripts
- Domain name registration with InterNIC
- FREE! Unlimited e-mail address forwarding
- Real-time web site statistics
- Full T3 to the Internet

IMC Interactive Multimedia Corporation
www.imconline.com
hosting@imconline.com

\$24.95

COMING SOON! Support for web based chat, news, commerce, & personalization.

CIRCLE 798 ON READER SERVICE CARD

ONE LINK TO HUNDREDS OF VENDORS

http://www.zdnet.com/marketplace

Net Marketplace™

The Most Advanced Internet Service Available

Online Marketing — Full Service Web Marketing

\$18.95/month

FREE EXTRAS
WWW/board installed • Guestbook installed
Free for all links page installed

- True virtual domain
- http://your-name.com/
- Access to our SSL
- Full POP mailbox
- Unlimited Email aliases
- Unlimited Infobots
- 3 Gigs of monthly transfer
- 50 megs of space
- Anonymous FTP site
- Weekly usage stats
- Your own cgi-bin full of scripts
- Front page supported

ADVANCED WEBPAGE ADMINISTRATION!

Visit us for same day setup — www.olm.net
Contact us sales@olm.net or 800-741-6813

CIRCLE 797 ON READER SERVICE CARD

The Hottest Concept in Notebook Cases on the Market Today!



Never has hard-shell protection looked so good — and been so affordable. The Showcase Adjustable Compartment Case is a sleek custom molded hard shell notebook carrying case with the Smart Track System permanently mounted inside. This system gives you the flexibility to create any size compartment you may need for your notebook, and accessories — and the option to change these compartments as often as you wish.

HARD-SHELL PROTECTION... SOFT-SHELL PRICE.

\$179.95

INCLUDES SHIPPING AND HANDLING
JFS Ground Next Day and Second Day Air Available

laptop case Model #SH-1 comes complete with permanently mounted inner frame, 1.6" thick 504 bags, 2.2" frame and 100% durable — shock resistant, track, links, and hinges only.

CALL FREE 24 HOUR CREDIT HOTLINE 1-888-268-5441

OR CIRCLE 799 ON READER SERVICE CARD

Work Coast to Coast!



Announcing the 1-800-Batteries Portable Power Pack

- Ultra thin and lightweight
- Built in power gauge
- Works with any laptop
- \$179

Call today free 1-800-228-8374

Batteries and Tools for 1-800-Batteries Mobile Professionals™

save \$2, order on the web www.800batteries.com

www. OR CIRCLE 551 ON READER SERVICE CARD

LIFETIME WARRANTY

MEMORY

LIFETIME WARRANTY

30PIN SIMMS

1MB	\$14
4MB	\$29

72PIN NON PARITY

4MB	\$20
8MB	\$39
16MB	\$84
32MB	\$172

72PIN EDO

8MB	\$46
16MB	\$82
32MB	\$179

NOTEBOOK MEMORY

AST

Ascenta J Series	
8/16/32MB	\$69/135/245

COMPAQ

LTE 5000	
8/16/32MB	\$74/139/249

Presario 1020,1030,1080	
8/16/32MB	\$69/135/269

Armada 1100,1120,1130	
8/16/32MB	\$75/135/259

FUJITSU

Milan, Lifebook 520	
8/16/32MB	\$75/135/269

IBM

Thinkpad 355,360 Series	
8/16MB	\$89/159

Thinkpad 760EX,ED, 365X, XD	
8/16/32MB	\$75/139/279

SHARP

PC 9000,9030	
8/16/32MB	\$89/149/279

TOSHIBA

Satellite Pro 400,415,100,105CS	
8/16/32MB	\$79/145/249

Tecra 710, CDT, 720, 730	
8/16/32MB	\$79/139/249

WE SPECIALIZE IN NOTEBOOK MEMORY

eritech

1-888-808-6242

Phone: 818-244-6242 • Fax: 818-500-7699
<http://www.eritech.com>

Prices subject to change.
Most items are shipped the same day

4551 San Fernando Road • Suite 110, Glendale, CA 91204 • email: eritech@sprynet.com

www. OR CIRCLE 552 ON READER SERVICE CARD

BASON HARD DRIVE WAREHOUSE

800-238-4453

Smaller than 2.0GB

100MB	Conner CP3100	SCSI	\$45
240MB	Seagate 3390A	IDE	\$115
540MB	Conner 30548	SCSI	\$119
540MB	Seagate 5660N	SCSI	\$139
640MB	Seagate 3630A	IDE	\$140
840MB	Quantum 840S	SCSI	\$179
840MB	Seagate 3851A	IDE	\$155
1.0GB	Quantum 31080S	SCSI	\$219
1.0GB	Samsung 310820	SCSI	\$169
1.0GB	Seagate 31055N	SCSI	\$189
1.0GB	Seagate 31080N	SCSI	\$189
1.0GB	WD 11000A	IDE	\$165
1.2GB	Quantum 31280S	SCSI	\$219
1.2GB	Seagate 31276A	IDE	\$169
1.2GB	WD 11200A	IDE	\$169
1.6GB	Seagate 31621A	IDE	\$175
1.6GB	WD 21600A	IDE	\$185
1.7GB	Quantum 31700A	IDE	\$189
1.7GB	Seagate 31720A	IDE	\$189

4.0 GB

Fujitsu 2954S	SCSI	\$559
IBM DCAS	SCSI	\$439
Micropolis 3243	SCSI	\$739
Micropolis 3243AV	SCSI	\$899
Micropolis 4345S	SCSI	\$699
Quantum GP34301	SCSI	\$759
Quantum 34300	SCSI	\$739
Quantum 34550S	SCSI	\$799
Seagate 15150N	SCSI	\$659
Seagate 34371N	Ultra	\$739
Seagate 14209N	Ultra	\$799
Seagate 34501N	Ultra	\$899
WD 34000A	IDE	\$399
5.0 GB		
Maxtor 85120A	IDE	\$379
9.0 GB		
Fujitsu 2949SYU	SCSI	\$899
Micropolis 1991	SCSI	\$899
Micropolis 1991AV	SCSI	\$899
Micropolis 3391S	SCSI	\$999
Seagate 410800N	SCSI	\$899
Seagate 19171N	SCSI	\$1099

Tape Drives

QIC		
3.2GB	10Mega 3200	\$159
4.0GB	Conner 4000i	\$349
DAT		
2.0GB	Conner 2000Ext	\$599
2.0GB	Conner CTD2004	\$499
2.0GB	WangDat 3100	\$499
2.0GB	HP 35470	\$499
4.0GB	Conner 4324	\$559
4.0GB	Conner CPT4004	\$529
4.0GB	WangDat 3200	\$599
4.0GB	HP 35480	\$599
7.0GB	Exabyte 8205XL	\$899
8.0GB	Conner 4326	\$659
8.0GB	WangDat 3400	\$659
8.0GB	HP 1533	\$829
8.0GB	Conner CTD8000	\$659
8.0GB	Sony 7000	\$759
14.0GB	Exabyte 8505XL	\$1759
16.0GB	Conner 4584	\$999

Wide SCSI Drives

1.0GB	Conner 1050W	\$219
1.0GB	IBM DFHS-W	\$219
1.0GB	Quantum 31070W	\$219
2.0GB	Micropolis 4421W	\$299
2.0GB	IBM DCAS-UW	\$329
2.0GB	Quantum 32150W	\$429
2.0GB	Quantum 32151W	\$429
2.0GB	Quantum 32170W	\$389
2.0GB	Seagate 32430W	\$479
2.0GB	Seagate 32550W	\$429
2.0GB	Seagate 32155-UW	\$499
2.0GB	Seagate 32171W	\$959
4.0GB	Fujitsu 29340AU	\$559
4.0GB	IBM DCAS-UW	\$499
4.0GB	Quantum 34301W	\$799
4.0GB	Quantum 34300W	\$739
4.0GB	Quantum 34550W	\$789
4.0GB	Seagate 15150W	\$789
4.0GB	Seagate 34371-UW	\$799
4.0GB	Seagate 34501-UW	\$999
9.0GB	Fujitsu 29490AU	\$999
9.0GB	IBM 39100W	\$1099
9.0GB	Micropolis 1991W	\$999
9.0GB	Micropolis 3391W	\$1099
9.0GB	Seagate 410800W	\$899
9.0GB	Seagate 19171-UW	\$1199
23.0GB	Seagate 423451W	\$2999

Hot-Swap Drives

1.0GB	Seagate 31230WC	\$289
2.0GB	Seagate 32171WC	\$899
4.0GB	Seagate 15150WC	\$999
4.0GB	Seagate 15230WC	\$999
9.0GB	Seagate 19171WC	\$1399
Differential Drives		
2.0-Pin		
5.0GB	HP 33250	\$349
2.0GB	Seagate 32550ND	\$559
4.0GB	Seagate 15150ND	\$999
68-Pin		
2.0GB	Seagate 32430WD	\$489
2.0GB	Seagate 32171WD	\$799
4.0GB	Seagate 34371WD	\$899
5.0GB	IBM 35250WD	\$999
8.0GB	Seagate 410800WD	\$1359
Controllers		
Adaptec		
1542PC		\$165
2940 PCI Wide		\$245
2940 PCI Ultra		\$189

1.0GB SCSI
Seagate 31055N
\$199

4.0GB
Ultra SCSI
IBM DCAS
\$439

2.5" Notebook Drives

SCSI		
81MB	Toshiba MK1926FB	\$379
IDE		
32MB	Seagate 9544AG	\$159
54MB	Seagate 9655AG	\$159
54MB	IBM DBAA-2540	\$159
73MB	IBM DBAA-2720	\$179
81MB	IBM DVAA-2818	\$189
81MB	Seagate 9816AG	\$169
81MB	Toshiba MK1926FCV	\$189
1.0GB	IBM SANADA 21000	\$229
1.0GB	Toshiba MK1002MAV	\$229
1.3GB	Seagate 91350A	\$259
1.4GB	Toshiba 1403MAV	\$259
1.7GB	Toshiba 1701	\$299
2.1GB	Toshiba 2101MAN	\$309
2.1GB	IBM DCRA-22160	\$349
2.1GB	Toshiba MK2103	\$349
3.0GB	Toshiba 3003MAN	\$499
3.0GB	IBM 2301	\$499

Kingston TECHNOLOGY

Highest Quality
Best Pricing
Generic Memory
Notebook HDDs

UPGRADE GROUP
800-718-7888
714-380-4845
www.upgrade-group.com

www. OR CIRCLE 554 ON READER SERVICE CARD

PC UPGRADE

...MBOARD 512k & 200*+=\$179...			
MEMORY		CPU	
4MB	\$18	P133	\$127
8MB	\$32	K6 166	\$229
16MB	\$70	K6 200*	\$279
32MB	\$125	K6 233	\$499
SD RAM 16/32/64-\$79/\$169/\$399			
P166/MMX/166+ \$169/\$249/\$79			
P200/200*/MMX \$289/99/349			
INTEL...CYRIX...AMD			
MASSIVE STORAGE			
1.20	\$179	2.10	\$199
1.60	\$199	2.50	\$229
TX Mb 512K - \$109			
M BOARD-V CARDS-MODEMS-CD-ETC			
MIAMI INT'L FAX (305) 436 - 0926			
9300 NW 25 St Suite110			
MIAMI, FLORIDA 33172			
M - F 9am - 6pm SAT 12pm - 5pm EST			
1-800-621-8309			
VISA - MC - AMEX - DISCOVER			
PRICES SUBJECT TO CHANGE			

www. OR CIRCLE 555 ON READER SERVICE CARD

BASON MEMORY WAREHOUSE

Call us!

Or visit our Web Page
for everyday low low prices!

800-400-9064

Standard 30-Pin SIMMS

4MB	4x3/4x9	\$25/\$35
72-Pin DIMMS for Notebook		
16MB	4x32	5.0V \$149
16MB	4x32	3.3V \$185

Standard 72-Pin SIMMS

4MB	1x32/36	\$20/\$29
8MB	2x32/36	\$33/\$55
16MB	4x32/36	\$69/\$79
32MB	8x32/36	\$139/\$149

EDO 72-Pin SIMMS

4MB	1x32	\$20
8MB	2x32	\$39
16MB	4x32	\$69
32MB	8x32	\$139

www. OR CIRCLE 553 ON READER SERVICE CARD

SUPERIOR COURT OF THE STATE OF CALIFORNIA FOR THE COUNTY OF SANTA CLARA

JUSTIN PERISH, D.C., et al, on behalf of	)	No. CV755101
themselves and all others similarly situated,	)	
	)	
Plaintiffs,	)	<u>Class Action</u>
v.	)	
INTEL CORPORATION and DOES 1	)	SUMMARY NOTICE
through 50, inclusive, Defendants.	)	OF SETTLEMENT

SUMMARY NOTICE OF CLASS ACTION AND PROPOSED SETTLEMENT

TO: ALL PERSONS OR ENTITIES IN THE UNITED STATES WHO DURING THE PERIOD SEPTEMBER 1, 1992 TO JULY 1, 1997 (the "Class Period") PURCHASED FOR THEIR OWN USE AND NOT FOR RESALE ANY DESKTOP PERSONAL COMPUTER, MOBILE PERSONAL COMPUTER, SERVER OR WORKSTATION, OR COMPONENT THEREOF (INCLUDING MOTHERBOARDS AND MICROPROCESSORS) ("PCs") EQUIPPED WITH INTEL486™ PROCESSORS, PENTIUM® PROCESSORS OR PENTIUM® PRO PROCESSORS.

PLEASE READ THIS SUMMARY NOTICE CAREFULLY. THIS SUMMARY NOTICE RELATES TO A PROPOSED SETTLEMENT OF LAWSUITS WITH INTEL CORPORATION. THIS IS ONLY A SUMMARY. THE PROPOSED SETTLEMENT IS DETAILED IN A NOTICE OF SETTLEMENT THAT YOU ARE ENCOURAGED TO READ IN ITS ENTIRETY. IF YOU ARE A CLASS MEMBER, IT CONTAINS IMPORTANT INFORMATION ABOUT YOUR RIGHTS AND THE EXCHANGE OF CERTAIN RIGHTS FOR THE RELINQUISHMENT OF CERTAIN CLAIMS SHOULD THE SETTLEMENT BE APPROVED.

YOU ALSO HAVE A RIGHT TO BE EXCLUDED FROM THE CLASS AS DETAILED IN THE NOTICE OF SETTLEMENT OF CLASS ACTION. IF YOU WISH TO BE EXCLUDED FROM THE CLASS YOU MUST FOLLOW THE PROCEDURES OUTLINED IN THE NOTICE OF SETTLEMENT. IF YOU DO NOT REQUEST EXCLUSION FROM THE CLASS AND THIS SETTLEMENT BECOMES EFFECTIVE YOU WILL BE GIVEN CERTAIN RIGHTS IN EXCHANGE FOR THE RELINQUISHMENT OF CERTAIN CLAIMS. THAT PROCEDURE WILL NOT GIVE YOU THE RIGHT TO A TRIAL ON SUCH CLAIMS, AND YOU WILL WAIVE YOUR RIGHT TO A TRIAL ON SUCH CLAIMS.

NOTICE IS HEREBY GIVEN, pursuant to California Code of Civil Procedure § 382 and California Civil Code § 1781 and an Order of the Superior Court of the State of California for the County of Santa Clara dated July 1, 1997, that a hearing will be held before the Honorable Socrates Manoukian in Department 3 located at 191 North First Street, San Jose, California at 9:00 a.m. on October 3, 1997 (the "Settlement Hearing") to determine (i) whether the proposed settlement (the "Settlement") of the above-captioned litigation (the "Consolidated Action") as set forth in a Settlement Stipulation dated July 1, 1997 (the "Settlement Stipulation") is fair, reasonable and adequate, and (ii) whether a final judgment should be entered dismissing the Consolidated Action on the merits with prejudice against the Plaintiffs and all members of the Settlement Class.

In brief, the Settlement Stipulation provides for Intel to do the following:

1. Each Settlement Class Member who purchased a PC containing a 120 MHz or a 133 MHz Pentium® processor between October 23, 1995 and January 5, 1996 shall be entitled to receive a certificate good for a \$50.00 rebate on the purchase of an Intel OverDrive® processor suitable for replacement of the micro-processor in their PC if they submit a qualified request for the certificate along with their retailer's receipt for the PC to Intel within the applicable time period and if they submit a qualified, completed certificate along with the retailer's receipt for a qualified Intel OverDrive® processor to Intel within the applicable time period.
 2. Intel will provide consumers with (i) certain kinds of information about the OverDrive® processor, including upgrade compatibility information provided by the manufacturers of PCs, and (ii) certain technical assistance.
 3. Intel has agreed to provide certain disclosures in the future regarding the iCOMP® Index 2.0 ratings and SPEC95 benchmark test results for its products.
- THE ABOVE IS ONLY A SHORT SUMMARY OF THE PROPOSED SETTLEMENT, ALL OF WHICH IS DISCUSSED MORE FULLY IN THE DETAILED NOTICE OF SETTLEMENT. THE PROPOSED SETTLEMENT, YOUR RIGHT TO PARTICIPATE IN THESE PROCEEDINGS, AND THE MEANS BY WHICH YOU MAY EXCLUDE YOURSELF FROM THE SETTLEMENT CLASS ARE DESCRIBED IN THE NOTICE OF SETTLEMENT. IF YOU ARE A MEMBER OF THE SETTLEMENT CLASS AND DESIRE ADDITIONAL INFORMATION OR A DETAILED PRINTED NOTICE OF SETTLEMENT, YOU MAY OBTAIN A COPY OF THE NOTICE OF SETTLEMENT BY CALLING INTEL AT 1-800-628-8686 AND ASKING FOR A COPY TO BE MAILED TO YOU. IN ADDITION, A FULL COPY OF THE NOTICE OF SETTLEMENT IS AVAILABLE AT INTEL'S HOME PAGE ON THE WORLD WIDE WEB ([HTTP://WWW.INTEL.COM](http://www.intel.com)). YOU MAY ALSO OBTAIN A COPY BY WRITING TO OR CONTACTING SETTLEMENT CLASS COUNSEL AT THE FOLLOWING ADDRESS:

Terry Gross
LAW OFFICES OF TERRY GROSS
One Maritime Plaza
Suite 1040
San Francisco, CA 94111
(415) 337-4200
counsel@tgross.com
www.tgross.com/intelsettlement

ALL QUESTIONS RELATING TO THE PROPOSED SETTLEMENT SHOULD BE DIRECTED TO COUNSEL FOR THE SETTLEMENT CLASS IDENTIFIED ABOVE. PLEASE DO NOT CALL OR WRITE THE COURT OR THE CLERK'S OFFICE FOR INFORMATION. THE CLERK'S OFFICE IS NOT PERMITTED TO GIVE LEGAL ADVICE.

Dated: July 1, 1997

By Order of the Superior Court of the State of California for the County of Santa Clara.

The Honorable Socrates Manoukian
Superior Court Judge

72 PIN SIMMS (177R, 200)

Model	Price
4096	1.10
8192	1.20
16384	1.30
32768	1.40
65536	1.50
131072	1.60
262144	1.70
524288	1.80
1048576	1.90
2097152	2.00
4194304	2.10
8388608	2.20
16777216	2.30
33554432	2.40
67108864	2.50
134217728	2.60
268435456	2.70
536870912	2.80
1073741824	2.90
2147483648	3.00
4294967296	3.10
8589934592	3.20
17179869184	3.30
34359738368	3.40
68719476736	3.50
137438953472	3.60
274877906944	3.70
549755813888	3.80
1099511627776	3.90
2199023255552	4.00
4398046511104	4.10
8796093022208	4.20
17592186044416	4.30
35184372088832	4.40
70368744177664	4.50
140737488355328	4.60
281474976710656	4.70
562949953421312	4.80
1125899866842624	4.90
2251799733685248	5.00
4503599467370496	5.10
9007198934740992	5.20
18014397869481984	5.30
36028795738963968	5.40
72057591477927936	5.50
144115182955855872	5.60
288230365911711744	5.70
576460731823423488	5.80
1152921463646846976	5.90
2305842927293693952	6.00
4611685854587387904	6.10
9223371709174775808	6.20
18446743418349556608	6.30
36893486836699113216	6.40
73786973673398226432	6.50
14757394734679652864	6.60
29514789469359305728	6.70
59029578938718611456	6.80
11805915787743722912	6.90
23611831575487445824	7.00
47223663150974891648	7.10
94447326301949783296	7.20
18889465260399966592	7.30
37778930520799933184	7.40
75557861041599866368	7.50
151115722083199732736	7.60
302231444166399465472	7.70
604462888332798930944	7.80
1208925776665978611808	7.90
2417851553331957223616	8.00
4835703106663914447232	8.10
9671406213327828894464	8.20
19342812426656577788928	8.30
38685624853313155577856	8.40
77371249706626311155712	8.50
15474249941325262311155712	8.60
30948499882650524622311155712	8.70
61896999765301049244622311155712	8.80
123793997506602098489244622311155712	8.90
247587995013204196978489244622311155712	9.00
495175990026408393956978489244622311155712	9.10
990351980052816787913956978489244622311155712	9.20
1980703960105533755827913956978489244622311155712	9.30
3961407920211067511655827913956978489244622311155712	9.40
7922815840422135033311655827913956978489244622311155712	9.50
1584563768484427006663311655827913956978489244622311155712	9.60
3169127536968854013333311655827913956978489244622311155712	9.70
6338255073937708026666633311655827913956978489244622311155712	9.80
126765101478754160533333311655827913956978489244622311155712	9.90
253530202957508321066666633311655827913956978489244622311155712	10.00

DIMMS (168 pin)

Model	Price
4096	1.10
8192	1.20
16384	1.30
32768	1.40
65536	1.50
131072	1.60
262144	1.70
524288	1.80
1048576	1.90
2097152	2.00
4194304	2.10
8388608	2.20
16777216	2.30
33554432	2.40
67108864	2.50
134217728	2.60
268435456	2.70
536870912	2.80
1073741824	2.90
2147483648	3.00
4294967296	3.10
8589934592	3.20
17179869184	3.30
34359738368	3.40
68719476736	3.50
137438953472	3.60
274877906944	3.70
549755813888	3.80
1099511627776	3.90
2199023255552	4.00
4398046511104	4.10
8796093022208	4.20
17592186044416	4.30
35184372088832	4.40
70368744177664	4.50
140737488355328	4.60
281474976710656	4.70
562949953421312	4.80
1125899866842624	4.90
2251799733685248	5.00
4503599467370496	5.10
9007198934740992	5.20
18014397869481984	5.30
36028795738963968	5.40
72057591477927936	5.50
144115182955855872	5.60
288230365911711744	5.70
576460731823423488	5.80
1152921463646846976	5.90
2305842927293693952	6.00
4611685854587387904	6.10
9223371709174775808	6.20
18446743418349556608	6.30
36893486836699113216	6.40
73786973673398226432	6.50
14757394734679652864	6.60
29514789469359305728	6.70
59029578938718611456	6.80
11805915787743722912	6.90
23611831575487445824	7.00
47223663150974891648	7.10
94447326301949783296	7.20
18889465260399966592	7.30
37778930520799933184	7.40
75557861041599866368	7.50
151115722083199732736	7.60
302231444166399465472	7.70
604462888332798930944	7.80
1208925776665978611808	7.90
2417851553331957223616	8.00
4835703106663914447232	8.10
9671406213327828894464	8.20
19342812426659966592	8.30
38685624853313155577856	8.40
77371249706626311155712	8.50
15474249941325262311155712	8.60
30948499882650524622311155712	8.70
61896999765301049244622311155712	8.80
123793997506602098489244622311155712	8.90
247587995013204196978489244622311155712	9.00
495175990026408393956978489244622311155712	9.10
990351980052816787913956978489244622311155712	9.20
1980703960105533755827913956978489244622311155712	9.30
3961407920211067511655827913956978489244622311155712	9.40
7922815840422135033311655827913956978489244622311155712	9.50
1584563768484427006663311655827913956978489244622311155712	9.60
3169127536968854013333311655827913956978489244622311155712	9.70
6338255073937708026666633311655827913956978489244622311155712	9.80
126765101478754160533333311655827913956978489244622311155712	9.90
253530202957508321066666633311655827913956978489244622311155712	10.00

APPLE POWER MAC

Model	Price
4096	1.10
8192	1.20
16384	1.30
32768	1.40
65536	1.50
131072	1.60
262144	1.70
524288	1.80
1048576	1.90
2097152	2.00
4194304	2.10
8388608	2.20
16777216	2.30
33554432	2.40
67108864	2.50
134217728	2.60
268435456	2.70
536870912	2.80
1073741824	2.90
2147483648	3.00
4294967296	3.10
8589934592	3.20
17179869184	3.30
34359738368	3.40
68719476736	3.50
137438953472	3.60
274877906944	3.70
549755813888	3.80
1099511627776	3.90
2199023255552	4.00
4398046511104	4.10
8796093022208	4.20
17592186044416	4.30
35184372088832	4.40
70368744177664	4.50
140737488355328	4.60
281474976710656	4.70
562949953421312	4.80
1125899866842624	4.90
2251799733685248	5.00
4503599467370496	5.10
9007198934740992	5.20
18014397869481984	5.30
36028795738963968	5.40
72057591477927936	5.50
144115182955855872	5.60
288230365911711744	5.70
576460731823423488	5.80
1152921463646846976	5.90
2305842927293693952	6.00
4611685854587387904	6.10
9223371709174775808	6.20
18446743418349556608	6.30
36893486836699113216	6.40
73786973673398226432	6.50
14757394734679652864	6.60
29514789469359305728	6.70
59029578938718611456	6.80
11805915787743722912	6.90
23611831575487445824	7.00
47223663150974891648	7.10
94447326301949783296	7.20
18889465260399966592	7.30
37778930520799933184	7.40
75557861041599866368	7.50
151115722083199732736	7.60
302231444166399465472	7.70
604462888332798930944	7.80
1208925776665978611808	7.90
2417851553331957223616	8.00
4835703106663914447232	8.10
9671406213327828894464	8.20
19342812426659966592	8.30
38685624853313155577856	8.40
77371249706626311155712	8.50
15474249941325262311155712	8.60
30948499882650524622311155712	8.70
61896999765301049244622311155712	8.80
123793997506602098489244622311155712	8.90
247587995013204196978489244622311155712	9.00
495175990026408393956978489244622311155712	9.10
990351980052816787913956978489244622311155712	9.20
1980703960105533755827913956978489244622311155712	9.30
3961407920211067511655827913956978489244622311155712	9.40
7922815840422135033311655827913956978489244622311155712	9.50
1584563768484427006663311655827913956978489244622311155712	9.60
3169127536968854013333311655827913956978489244622311155712	9.70
6338255073937708026666633311655827913956978489244622311155712	9.80
126765101478754160533333311655827913956978489244622311155712	9.90
253530202957508321066666633311655827913956978489244622311155712	10.00

DELL OPTIPLEX 6800 200

DEI. & GATEWAY	
4096	1.10
8192	1.20
16384	1.30
32768	1.40
65536	1.50
131072	1.60
262144	1.70
524288	1.80
1048576	1.90
2097152	2.00
4194304	2.10
8388608	2.20
16777216	2.30
33554432	2.40
67108864	2.50
134217728	2.60
268435456	2.70
536870912	2.80
1073741824	2.90
2147483648	3.00
4294967296	3.10
8589934592	3.20
17179869184	3.30
34359738368	3.40
68719476736	3.50
137438953472	3.60
274877906944	3.70
549755813888	3.80
1099511627776	3.90
2199023255552	4.00
4398046511104	4.10
8796093022208	4.20
17592186044416	4.30
35184372088832	4.40
70368744177664	4.50
140737488355328	4.60
281474976710656	4.70
5629	

Motherboards

486 UMC, built in I/Os, 3PCI/4ISA	\$58
256k SRAM module for 486 mb	\$14
Triton 430VX ISAPCI, built in I/Os, built in 512k PLB	\$80
Triton 430TX ISAPCI, built in I/Os, built in 512k PLB	\$100
CPUs	
100 133 150 166 200	
Pentium	\$100 \$115 \$140 \$158 \$275
MMX	N/A N/A N/A \$273 \$378
PRO	N/A N/A \$199 N/A \$499
AMD K5	\$64 \$77 N/A \$105 N/A
AMD K6	N/A N/A N/A \$244 \$304

Video

Trident 9680 1MB	\$30
Trident 9680 2MB	\$40
S3 Virge AMB PCI	\$65
14" 15" Monit	\$28 \$183 \$234

Multimedia

Sound Board	\$25
CL Speakers CS-46	\$17
CD-Rom 15x	\$79

Combo Deals

Motherboard w/512K and Intel Pentium + Cooling Fan
166Mhz - US\$ 250
200Mhz - US\$ 350
200Mhz MMX - US\$ 450
486 Motherboard and AMD X5/133+ Cooling Fan
US\$ 110.00

Add a Case to any of the above for US\$ 40.00 More

Multimedia Computer \$899

Triton 430 VX with 512K PLB Cache
 33.6 Fax/Modem with Voice and Headset
 16 MB of EDO Memory
 Windows 95 - Keyboard and Mouse
 With AMD K5-166

Trident 9680 with 1 MB (monitor sold separately)
 16 Speed Multimedia Kit w/Speakers
 1.6 GB Western Digital Hard Disk
 Please Call for other CPU Options

US\$ 899 With Intel Pentium 166 US\$ 949

DLP Computers

Please check our web at www.dlpcomputers.com for more products and updated offers.
800-241-2093 Mon - Fri 10am-7pm
 Sat 10am-3pm EST

www. OR CIRCLE 562 ON READER SERVICE CARD

DATA NETWORKS/PC'S/UPGRADES**MODEMS/PHONES/VOICEMAIL/+++****WEB CATALOG www.bluecomm.com****COMMUNICATIONS**

- Modems - World's Largest Selection from A to Z. ISDN/56k/45/33.6/2400 All Makes & Models - \$49
- MultiPort I/O by DigData/Comins/Tippinov/Boca
- Routers/Bridges Green/Ascend/Linkson/Moranda
- DSL/DSL's for Digital & T1 Gateways/Frame Relay
- Multiplexers - Data & Voice by Microm/Multitech
- Network Cards - 56k/Modem/100Mbit/s - \$29

COMPUTERS

- Pentium 133/166 1.2GB 16MB 14" Mon. - \$995
- Pentium Pro 200 1.2GB 32MB 14" Mon. - \$2395
- IBM/Compaq/HP/Toshiba/NEC/AST & More
- Notebooks 1000's in Local Stock - All brands & models
- Memory & CPUs for all computers - SCALL
- Custom PC w/Batchphone & Servers - BELLIS WANTED
- **COMPUTER TELEPHONY & ACCESSORIES**
- Voice Mail Systems - 2/4 Ports or more - \$595
- Telemarketing/Dialing Call Back & Debit Card Systems
- Multiline Phone Systems for office or home - SCALL
- Phones for Business, Decorator & Novelty
- Fax/Phone & Caller ID - Switches & Routers - SCALL
- Mobile Comm Accessories for the Road Warrior
- Cellular Accessories/Batteries & More

BLUE LINE COMMUNICATIONS WAREHOUSE, INC

100 N. Vermont St. 800-258-7810
 714-999-2441
 Anaheim, CA 92705 Fax 714-999-2442

www. OR CIRCLE 565 ON READER SERVICE CARD

Save more when ordering online
WWW.MICROSHACK.COM

Complete CD-Recording Kit

4x Read 2x Write **Lowest Price Ever!**

\$359

By Panasonic

- Internal CD-R Drive
- Adaptec SCSI-2 Controller Card & Software
- Gear CD-R Mastering software for Win 3.1, Win 95, NT, OS/2 Warp, Mac and PowerMac
- 2 Blank CD-R Media
- Data Cables & Mounting Screws
- Installation Guide

Blank CD-R media \$4.95 (min 10)

Internet Color Digital Camera

Motion & Still Image Capabilities **\$169**

video interfacing Over the Internet

- No Video Capturing Card Needed
- Plugs into any Parallel Port
- No Power Adaptor Needed
- 16.8 Million True Color and 256 Greyscale
- Supports JPEG, BMP, GIF, PCX, TGA, TIFF
- Supports MSN Networking
- 1 Year Warranty and Support

24X CD-ROM Drive

The World's Fastest Drive **\$129**

By Panasonic

Full Retail Packaging!

- IDE Interface
- Includes Cables & Driver Software
- 1 Year Warranty

Flatbed Color Scanner

11 Office & Studio Software Included **\$169**

ScanIt 2.0

- Single-Pass
- Up to 4800 dpi Resolution
- 24-bit color & 8-bit Grayscale
- 8.5" x 11.7" Scan Window
- 11 Award Winning Software Included (ScanItastic)

56K Fax/Modem with Voice & Speakerphone Function

\$119 External: \$139

VideoPhone Ready

• Rockwell Chipset

• 6 Year Warranty

- Western Digital Caviar 4.0 GB HDD \$309.00
- Quantum Bigfoot 3.25" 6.4 GB HDD \$369.00

Best Value

MicroShack corp.

1-888-99-SHACK

(810) 726-5474 Fax (810) 726-5538

Visit our WEB site for the latest specials & prices

WWW.MICROSHACK.COM

email: salesinfo@microshack.com

42140 Van Dyke Buils 170 - Sterling Hts, MI 48314

Prices subject to change without notice

www. OR CIRCLE 566 ON READER SERVICE CARD

HIQ

HIQ COMPUTER

800-827-5836

www.hiq.com

Next Day Shipment on Advertised Systems

pentium
Cyrus

HiQ K6-PR166
AMD K6-PR166MHz

- Intel 430TX Chipset MB
- PC Power & Cooling Heat Sink
- 16MB EDO Ram
- 1.44MB Floppy Drive
- 1.7GB EIDE Hard Drive
- Matrox Mystique 2MB SGRAM Video
- 12X CD-ROM Drive
- Soundblaster 16 Sound Card

- Windows 95 on CD-ROM
- Office Professional 97 on CD-ROM
- ATX Mid Tower Case
- Labtec CS800 Speakers
- 104 Keytronic PS/2 Keyboard
- Microsoft PS/2 Mouse
- Monitor 15" Panansonic S15

\$1499

HIQ WARRANTY: Three Year Part One Year Depot Labor

Upgrade to K6-PR200—**\$149** Upgrade to 32MB EDO RAM—**\$79**

Upgrade to Panasonic S17—**\$249**

Upgrade to US ROBOTICS 33.6 MODEM—**\$99**

Sunnyvale, CA **800-827-5836** • San Anselmo, CA **800-929-1893**

Sacramento, CA **916-635-7842** • Chicago, IL **800-819-4588** • Atlanta, GA **800-875-2882**

Boston, MA **800-249-1886** • Denver, CO **303-338-1300**

*Systems must be ordered before 11PM and not deviate from the Standard Advertised System • All Returned Items Must Have & Return Merchandise Authorization Number (RMA#) And Must Be in Original Packaging • The Cost Of Return Freight Is Not Included With Any Money-Back Guarantees • Shipping Charges Are Not Refundable • Prices and Product Descriptions Subject To Change Without Notice • HIQ Computer Systems Cannot be Responsible for Omissions or Errors in Typographical or Photographic • Pentium and Intel Inside Logo are Registered Trademarks of Intel Corporation • Some of the Names or Trademarks shown herein may be the Properties of other Companies • HIQ Computer Systems, Inc. 1997. All Rights Reserved

HIQ

HIQ COMPUTER
800-827-5836
www.hiq.com

"Your Computing Solutions Partner"

www. OR CIRCLE 564 ON READER SERVICE CARD

COMPUTER PRODUCTS FOR INTERNATIONAL USE

"Your International Resource in the U.S."



"Many Models Are IN STOCK Ready For Immediate Shipment."

"All HP Products Sold With Manufacturer's International Warranty."

220 Volt Product:

- Printers
- Servers
- Computers
- UPS Units
- Scanners
- Surge Protectors
- Plotters
- Modems
- Specialty Papers
- Ink Cartridges
- Toner
- Printer Accessories

CALL TOLL FREE 1-800-505-4676

horizon computer group, division of Horizon Trading Company, 1510 H Street NW, Washington, DC 20005 USA, Tel: 202-783-6910, Fax: 202-783-6914, 202-783-4465, e-mail: horizoninc.com, World Wide Web http://www.tradecompass.com/horizon/computers

"Horizon Trading Company—Providing Export Services Since 1980"

hcg001

CIRCLE 566 ON READER SERVICE CARD

POS Printers/Cash Drawers



Low-Cost POS Solutions.

- POS compulsory drawers
- Samsung SRP 100 series POS receipt printers. • 3.2 lines/second. • Cash drawer kick-out

CRS

1-800-333-4949 ext 433

CRS, Inc. 2409 Anthony Lane N. Minneapolis, Minnesota 55411 612/781-4416 ext 433 www.crs.com

CIRCLE 570 ON READER SERVICE CARD

Barcoding just got a lot easier...

Keyboard Wedge Solutions

- Hand-Held Laser Starting at \$220
- 60mm or 80 CCD special price \$120
- Hewlett Packard Wand Reader \$150



FREE BarFonix with Purchase

DATAVISION
Offices Nationwide

1-800-375-9063

215-396-0308

www.data-vision.com

Call For Our Free Catalog

CIRCLE 571 ON READER SERVICE CARD

MBS COMPUTERS

Micro Business Systems Inc.
#110, 7110 - 120th Street, Surrey, B.C., V3W 3M8
Tel: (604) 572-8722 Fax: (604) 572-9666

IBM Compatible Computer Systems

Custom built to your own
SPECIFICATIONS

You simply choose what you want
we will build, configure and install it for you

**What you want is
what you get!**

Committed to quality.....Focused on price.

#110, 7110 - 120th Street, Surrey, B.C., V3W 3M8 Tel: (604) 572-8722 Fax: (604) 572-9666

For further information visit our WEB site
www.microbiz.net or e-mail us at sales@microbiz.net

CIRCLE 567 ON READER SERVICE CARD

Rite-Way Computers

Don't Kill It Upgrade It!!

We Carry Bare Bones Kits,
Hard Drives, Memory,
Video Cards, Modems,
And Much Much More!!
Visa / Mastercard / Discover
No Surcharge!
Call for Latest Pricing
360-240-0981

Visit Our Web site
www.ntgr.com/rite-way

©WWW.CIRCLE 568 ON READER SERVICE CARD

INTELLIGENT PENTIUM EXPLORE SYSTEM

- Triton III Multimedia System w/ 120 MHz CPU
- 16 MB of DRAM EDO memory
- US Robotics Sportster 56k Internal V.90
- 12X Toshiba CD-ROM Drive
- 2.5 GB WD EIDE Hard Disk Drive
- 1.44 MB Teac Floppy Drive
- 3D Graphic Card 2MB
- Mini tower case w/ Display
- Mouse & Pad
- Win95 keyboard
- Pentium 200/166/150/133 \$969/\$899/\$859/\$839
- MMX P's 200/166 \$1,259/\$989
- INTEL 233/266 SCALLS

We provide ethernet as low as \$17 a month
Upgrades & Services Available

Call for the best prices on more Systems,
Motherboards, Cases, CPU's, Hard Drives,
Memory, Monitors, Printers & Software

800-714-4371

2 BG COMPUTER

1060 Scott Blvd. • Santa Clara CA 95053
408-988-2968 Fax 408-988-2686
http://www.infinex.com/~libgcom
Email 2bgcom@infinex.com
Business Hours M-F 9-6, Sat 10-5 PST

©WWW.CIRCLE 569 ON READER SERVICE CARD

International Technologies &
Systems is a complete solutions
provider and long-term
partner to industry,
government and retail.

**GSA
Listed**

Magnetic Stripe Readers from \$79

Portable Data Collectors from \$499

Wand, CCD & Laser
Complete Scanning Solutions from \$99

CALL TODAY!
EAST 800-826-1688
WEST 800-228-9487
+1-714-990-1880



Quick Set-up • No-Risk Policy • Free Technical Support • Same Day Shipping

CIRCLE 572 ON READER SERVICE CARD

The Power to be Efficient.



Laser Packages

- Including decoder & cables
- Extremely fast and accurate
- Ergonomically designed
- Very rugged and durable
- Even reads poorly printed bar codes



Wand Packages

- Including decoder & cables
- Rugged construction
- Lowest cost input device
- Extremely high first read rates
- Reliable, durable and accurate



New!
Omnidirectional Laser Scanners



CCD Packages

- Including decoder & cables
- Very fast and accurate
- No moving parts to break
- Completely solid state
- Ergonomic design
- Very rugged and durable
- Less expensive than lasers



Mag Stripe Packages

- Includes decoder & cables



Highest First Read Rates!

Portable Readers

- Operates on one 9-volt battery
- 54-key alpha/numeric keyboard
- Date and time stamps
- Auto power off with resume
- Incorporates American Microsystems' industry-leading decoding algorithm



Label Design Software

- Full range of bar code capabilities
- Very easy to use
- Full featured label design software for Windows
- Scalable fonts
- Rotatable text and graphics
- Floating color and tool bars



Hands-Free Laser Scanners

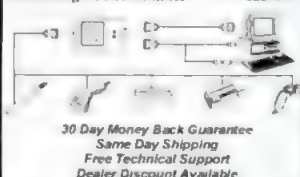
Call Now for a Free Catalog!
Lifetime toll-free support • 13 years in business
Thorough quality control • Same-day shipping
Top quality products made in the USA
DEALER INQUIRIES WELCOME

AMERICAN MICROSYSTEMS, LTD.
800 648 4452
FAX 817 685 6232 • WWW.AMLTD.COM
2190 Regal Parkway • Euless, Texas 76040

© www.

Best Price/Performance Solutions

Undecoded Wand	\$39.00
Wedge/Serial Decoder	\$89.00
Undecoded CCD	\$109.00
Keyboard Wedge CCD	\$129.00
Undecoded Slot Reader	\$89.00
Keyboard Wedge Slot Reader	\$139.00
Undecoded Magstripe Reader	\$39.00
Kbd Wedge Magstripe Reader	\$129.00
59 Key Programmable Kbd	\$99.00
LCD Customer Display (20x2)	\$129.00
Serial Cash Drawer	\$129.00
Undecoded Laser Scanner	\$229.00
Kbd Wedge Laser Scanner	\$259.00



FAMETECH AMERICA, INC.
Tel: (612) 331-4656 Fax: (612) 331-7010
E-mail: tyss@aoi.com (800) TYSSO-ID
Internet: http://members.aol.com/tyss

CIRCLE 574 ON READER SERVICE CARD

SYSTEM ID™
1401 Capital Ave. Plano, TX 75074

FREE 100 Page Catalog With 1000'S Of Products

VOLUME SPECIALS!
Symbol LS 4000

Qty	Each
1	\$399
2-3	\$359
4-7	\$345
8-10	\$339

AS LOW AS \$339

Complete Kits • Fonts • RF
• Portable Readers • OCR
• Bar Code Scanners • Software
• Special Application Products
• POS Systems • Ribbons • Labels
• Printers • And Much More!

New Equipment At Discount Prices
• Same Day Shipping
• 30 Day No-Hassle Money Back Guarantee
• Toll Free Technical Support

VOLUME SPECIALS!
Percon PT2000

Qty	Each
1	\$529
2-3	\$489
4-7	\$475
8-10	\$469

AS LOW AS \$469

CALL 1-800-397-9783 or 972-516-1100

Visit Our Internet Address @: <http://www.systemid.com>

BORNE PRESS FedEx POS, COB or Credit Cards

CIRCLE 573 ON READER SERVICE CARD

Bar Code Headquarters

Labeling Software

For LaserJet, DeskJet, etc.

For Windows
and DOS!



- Any Format, Any Label. WYSIWYG Design
- Formats for Sears, K-Mart, Penney's, WalMart, TCIF, Logmars, EIA, AIAG, etc.
- Prints Bar Codes: UCC/EAN-128, Code 128, UPC/EAN, 2 of 5, MSI, Codabar, Code 39
- Simple Custom Operator Interface
- LabelRIGHT™ for Windows™ - \$295
- LabelRIGHT™ for DOS - \$279

Bar Code Fonts for Windows™

- Insert bar codes into any font based Windows program by Clipboard or Hot Key.
- Prints UPC/EAN, UCC-128, Code 128, Codabar, Code 39, Interleaved 2 of 5
- For dot-matrix and laser printers - \$199

Bar Code Readers

for IBM PC, Mac and RS-232 Terminals



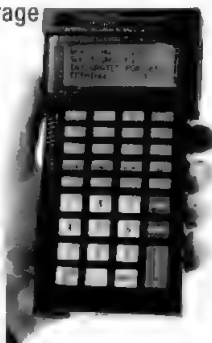
- Attaches as Second Keyboard
- Add Bar Code Reading to any Software
- For Windows, DOS, Novell, UNIX, Mac OS
- Code 39, UPC/EAN, 128, 2 of 5, Codabar, 93
- Wand, Magstripe, CCD, Slot Badge or Laser
- Top Rated by Independent Reviews
- Complete Reader with Wand only - \$299
- Cordless "Laser-Like" CCD Scanner - \$599
- Complete Integrated Laser Scanner - \$649

Portable Bar Code Readers

for IBM PC, Macintosh, and
Serial Interface Computers

WITH
VOICE!

- Battery Operated Batch Data Collector
- 64K or 256K Data Storage
- Display messages & voice messages prompt operator.
- Pick lists, tables.
- Wand, CCD or Laser Scanner
- Code 39, UPC/EAN, 93, 128, Codabar, etc.
- Very Easy to Create Custom Prompts
- Small Size-Weighs only 12.5 oz.
- 64K Complete with Wand & Voice - \$759
- 64K unit with Integrated Laser - \$1299



2-Way Radio Reader



- Scan and Key Data On-line with Portable Wireless Reader
- Computer Sends Display and Voice Messages
- 1,000 Ft. Range from Base
- Bar Code Input by Wand, Laser or CCD
- 6.3" x 3.3" x 1.25", 14 oz.
- Base Station - \$845
- Complete Terminal with Wand Scanner - \$1215
- With Integrated Laser Scanner - \$1790

We're not Just a Dealer!

WE'RE THE MANUFACTURER, SO YOU GET:

- Better pre-sale Advice on a Full Selection of Solutions of Simple wedge to Portable Batch to RF Wireless plus Bar Code Software
- Better post-sale Support
- 24 hour Turnaround on Repairs

Ordering is Easy!

1-800-345-4220

- Made in the USA ■ "800" Tech Support ■ 30 Day \$ Back Guarantee
- Qualified P.O.'s Accepted ■ 2 Year Warranty on Readers
- Same Day Shipping
- Free UPS Blue in US
- Direct from the Manufacturer

WORTHINGTON
DATA SOLUTIONS

Europe Phone: (353) 1 6614 566 • Fax: (353) 1 6614 622 • USA Phone: 408-458-9938 • Fax: 408-458-9964 • Web: www.barcodehq.com

CALL FOR FREE
CATALOG AND
BAR CODE
PRIMER!

PORTABLE PRODUCTS

YOUR COMPLETE SOURCE FOR BAR CODE AND HANDHELD DATA COLLECTION SYSTEMS

- BARCODE READERS - Keyboard wedge, RS-232, PC, Mac. Most data terminal interfaces
- INPUT DEVICES - Laser, CCD, Wand, Slot, Magstripe - All available with built-in decoder
- PORTABLE HANDHELD READERS - DOS & Windows Application Generators - No programming experience needed. Develop your Application in minutes.
- Printers, Verifiers, Label Software, Labels, Plug-N-Play RF Systems, Wireless PDA's

FREE UNLIMITED 800 TECH SUPPORT
UNCONDITIONAL SATISFACTION GUARANTEE

CALL FOR FREE CATALOG

1-800-849-0958

http://www.portableproducts.com

**PORTABLE
PRODUCTS**

8401-K Mayland Drive • Richmond, VA 23294
phone 804-346-0111 • fax 804-346-0196

CIRCLE 575 ON READER SERVICE CARD

Mouse Pads



Custom
Printed
• Your Logo
Design

• Fast
Turnaround

• Guaranteed
Quality

MicroStore™
800-962-8885

FAX: 507-
665-2604

LE SUEUR,
MN 56058

**Wrist
Supports**

CIRCLE 576 ON READER SERVICE CARD

**THE BEST
PLACE ON THE
WEB TO SHOP
FOR ANYTHING
COMPUTER
RELATED JUST
GOT BETTER!**

http://www.zdnet.com/
marketplace

zDNet Marketplace™

When you're serious about Order Entry Get Serious With

MailOrderManager[™]

If you're a cataloger, retailer, wholesaler, distributor—anyone selling products or services by phone, mail, or even the World Wide Web—get complete control of your business with M.O.M. With M.O.M. you only need one program on your PC or PC Network to run your entire business—order entry, credit card processing, inventory, purchasing, contact management, shipping, mailing list management, accounting and reporting.

1-800-858-3666

<http://www.MailOrderCentral.com>

Dx dcomp Development Corp
150 River Road, Suite N.1 Montville, NJ 07045

CIRCLE 577 ON READER SERVICE CARD

GUARANTEED PROFITS

- ◆ \$500 TO \$2000 p/w
- ◆ NOT multi-level
- ◆ Full or Part Time
- ◆ Earn Money 24 HRS
- ◆ No Exp. Necessary
- ◆ Full Time Support
- ◆ FREE Start-up
- ◆ Limited Offer - CALL!



(800) 341-7868

CIRCLE 614 ON READER SERVICE CARD

ONE STOP



symbol

CERTIFIED VAR



Bar Code
Scanners

Portable Data
Terminals

Bar Code
Printers/Media

Software
Solutions



StrandWare
Bar Code Printing Software



Monarch
Marking Systems



BAR CODE



www.datarecognition.com

512-349-6201 fax
sales@dri.com

2929 Longhorn Blvd., Suite 103
Austin, TX 78758-7628



Same-day shipping* of in-stock products from Symbol Technologies, Monarch, StrandWare and all major manufacturers.

Easy to Order • Call 800-541-9645

*ORDER BY 3 P.M. CST

CIRCLE 578 ON READER SERVICE CARD

**For fast, easy, inexpensive incorporations
and LLC's on-line or by phone:**

WWW.INCORPORATE.COM

1-800-542-2677, Ext. 6282

- As little as \$45 plus state filing fees
- Direct — No lawyer necessary
- All 50 states

The Company Corporation[™]

Incorporating over 160,000 businesses since 1972

©1997 The Company Corporation

CIRCLE 579 ON READER SERVICE CARD

DVD MPEG

1-888-dvdmpeg (383-6734)
www.dvdmpeg.com

- VCD & DVD TITLES FROM \$15.88
 - 2-4 FREE CDS WITH DVD PLAYERS
 - DVD UPGRADE KITS • MPEG CARDS
 - SVGA + TV TUNER COMBO CARDS
 - PC TO TV CONVERTER • TV TUNERS
- 9430 Warner #M, Fountain Valley CA 92708
Call 714 378 3167 Fax 714 378 3171

CIRCLE 584 ON READER SERVICE CARD

Hundreds of Barcode Products & Great Customer Service!

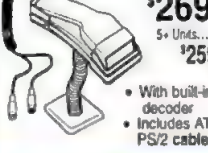
Barcode
 DISCOUNT
 WAREHOUSE, INC.

 Will Beat Any
 Advertised Prices for
 Comparable Merchandise
Star SP212FC/FD
Receipt Printer

\$235

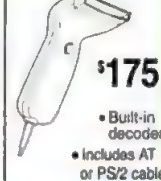

 Cash Drawer
 and Receipt
 Printer Combo
 Available
Metrologic 951/47
Laser Scanner

\$269


 5+ Units.....
 \$259

CCD Scanner

\$175


 • Built-in
 decoder
 • Includes AT
 or PS/2 cable

PSC Quickscan 8000	\$395	EZBarcode SerialWand	\$149
Metrologic MS6720/47	\$895	MMF ECD200 Cash Drawer	\$180
Percon PT2000/128K	\$595	Star SP312FC/FD	\$445

Call for a FREE Catalog! 1-800-888-2239


 Phone: (216) 582-1144 • Fax: (216) 582-1177
 e-mail: bcdw@coil.com • Internet: www.bcdw.com
 9841 York Alpha Dr.-Unit C, North Royalton, OH 44133

CIRCLE 580 ON READER SERVICE CARD


 Don't buy any
 accounting software
 before you see
 our program!

- Order Processing
- Inventory Control
- Point of Sale
- Accounts Receivable
- Accounts Payable
- Shipping Labels
- Payroll
- Bank Reconciliation
- Profit Analysis
- Credit Card Processing
- Transaction Security
- XBase Compatible
- On-line Help
- Check Printing

STORM+S.O. Fully Integrated
Management & Accounting system

- General Ledger
- UPS Manifest
- Serial # Tracking
- Service Invoicing
- Purchase Order
- Multiple
- RMAs
- Back Orders
- Barcode Printing
- Barcode Reading
- Multi-Tier Sales Tax
- E-Mail Chat
- Contact Management
- Appointment Calendar
- To-Do-List
- Mailing List

770.447.6257

www.bstorm.com

(Newport, GA 30071)

CIRCLE 581 ON READER SERVICE CARD

MICR \$99
Check
Software

- Windows 95/3X
- Unlimited bank & company accounts
- FREE 30 day trial—download from <http://printer.com>
- MICR Tester, Toner, Check Security Bond Paper

PRINTER
DATASCRIBE, INC.

300 Pearl St., Buffalo, NY 14202

716-842-3099

Fax 716-842-6049

CIRCLE 582 ON READER SERVICE CARD

PROTECT Your Software. INCREASE Your Revenues.

With software piracy costing developers 50% of their revenues, more and more developers are choosing to protect their software. And more of these developers are choosing HASP®. Why?

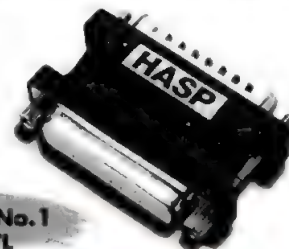
Because HASP offers unmatched security, reliability, and ease-of-use. HASP, the acknowledged industry standard, has sold three million keys in over 100 countries worldwide.

HASP will help you increase sales, control distribution, prevent piracy, monitor network licensing, and much more.

**To learn how you can easily sell more software –
call now to order your low-cost HASP Developer's Kit!**

North America 800 223-4277, 212 564-5678, Fax: 212 564-3377, Email: hasp.sales@us.aks.com
International +972 3 636-2222, Fax: 972 3 537-5796, Email: hasp.sales@aks.com

CIRCLE 583 ON READER SERVICE CARD


www.aks.com
ALADDIN™

The Professional's Choice

CALLING CARDS
 A Multi-Billion-Dollar Industry

More money will be made in value added long distance resale than any other single area in American business today!

**Start Your Own
Phone Company**
Point 2 Point - PC Platforms

- 24 to 1200 Lines
- Rackmount PC's
- Calling Cards
- Dialogic SCSA
- Int'l Call-Back
- Windows NT

No-Interest Financing

Only \$10,000 down and \$995 mo

Resale Cards

 Cards From 1-1000
 PINs From 1-1000
 Great Int'l Call-Back Rates
 Custom Cards and Promotions

Call today to receive a FREE calling card and our informative book "How To Cash In On The Calling Card Industry!"

RCP COMMUNICATIONS FX 800-234-8860

800-845-2716

www.debit-cards.com

CIRCLE 584 ON READER SERVICE CARD

FREE PHONE SUPPORT for WINDOWS NT

 • Complete listing and current prices
 • Call for Quantity and MOLP Discounts


Microsoft BackOffice 2.5	\$2279
NT 4.0 Resource Kit	WS-\$54 / SRV-\$109
Windows NT Training Kit	\$137
NT 4.0 Upg....	\$39 Both.... \$169
Windows NT 4.0 Server w 5 Client Access	\$749
Windows NT 4.0 Server w 10 Client Access	\$1039
Windows NT 4.0 - 20 Client Access License	\$609
Windows NT 4.0 - Single Client Access Lic.	\$36
Upgrade to NT 4.0 Server w 5 Client Access	\$375
Upgrade to NT 4.0 Server w 10 Client Access	\$495
Upgrade Windows NT 4.0 - Single Client Lic.	\$18
Upgrade Windows NT 4.0 - 20 Client License	\$305
Windows NT 4.0 Workstation (CD)	\$294
Windows NT 4.0 Workstation License	\$249
Upgrade to NT 4.0 Workstation from NT 3.x	\$135

JSI, Inc. 800-585-9588 770-475-3820

 1045 Essex Court
 Alpharetta, GA 30201-3811
 Email jsi@cis.compuserve.com

CIRCLE 585 ON READER SERVICE CARD

Home Study
**ACCREDITED
B.S. DEGREE
in
Computer Science**

Easy-to-study lessons in Multimedia, C, C++, Windows 95, Java, Visual Basic, Networks, Unix, Database Design, Software Design, & many more lead to the only home-study BSCS degree accredited by an agency recognized by the U.S. Department of Education.

Professional software & hardware provided at no extra charge. Programs in Computer & Electronics Engineering Technology as well. All accredited by the Distance Education and Training Council and VA approved. Our 47th year.

Free Catalog: 1 (800) 955-2527

**GRANTHAM
College of Engineering**

Grantham College Rd., Sildell, LA 70469-5700

Serious Software Licensing and Copy Protection without Hardware Keys or Disk Keys

Our protection actually adds features to your software without the cost and aggravation of hardware keys.

- ✓ Prevents unauthorized use & duplication
- ✓ Completely secure from all diskcopy systems
- ✓ Great for Internet & CD-ROM distribution!
- ✓ Not fooled by back-dating or re-installation
- ✓ Intelligent, reliable, cost-effective, easy to integrate and even easier to support

As CrypKey Instant, protects EXEs or data in 5 minutes, no coding! Foreign Languages! NEW: CrypKey for EXCEL spreadsheets!

- ✓ Complete flexibility in licensing, including use by runs, time, enable or add options by phone/fax or e-mail
- ✓ Ready-To-Try feature lets your customers run for one limited trial period
- ✓ Supports DOS, Win3.x, Win 32s, Win95, Win95B(FAT-32), Win NT, OS/2 & intelligently manages network licensing on all Novell & Microsoft based networks.

"The best combination of features, security, reliability, ease of use and price!"

Try CrypKey Instant FREE for 30 days: <http://www.kenonic.com/crypkey.htm>

Kenonic Controls Ltd., Calgary, Canada. Ph: 403-258-6200, Fax: 403-258-6201, e-mail: crypkey@kenonic.com

OR CIRCLE 580 ON READER SERVICE CARD



100% Satisfaction Guaranteed!

If you use this...



You need this...

J-BOTS™

Fast, fun, easy Add-In for Microsoft® Front Page® 97

www.WebsUnlimited.com

1-888-90-JBOTS

(that's 1-888-905-2687)

CIRCLE 586 ON READER SERVICE CARD

KEY-LOK™ Piracy Prevention

- ☐ 15 years effective prevention
- ☐ Very easy to implement
- ☐ Algorithmic response
- ☐ Programmable memory
- ☐ Remote update - Free
- ☐ Counters & Lease Control
- ☐ Multiproduct licensing
- ☐ Network Support
- ☐ DOS/WIN3.x/WIN95/WINNT
- ☐ Tech support 7 by 24 (800)
- ☐ \$14/1,000, \$16/10, \$20/2

No setup fees

www.keylok.com

Also, Access Control Systems & Disk Drive/System Locks

Microcomputer Applications

3167 E. Otero Circle
Littleton, CO 80122

(800-453-9565)

(303) 770-1917 FAX - (303) 770-1863

CIRCLE 582 ON READER SERVICE CARD

UNIKEY® Protects Better!

Secure your software, data and profits with UniKey, the piracy solution from the industry's most experienced provider.

UniKey provides:

- Cross platform flexibility • Quick & easy implementation
- No access to source code required • Superior customer service

Call now for your **FREE** Info Kit & Test Drive Disk

800-841-1316

SOFTWARE SECURITY

www.softsec.com

Phone: (203) 656-3000 • Fax: (203) 656-3932

OR CIRCLE 591 ON READER SERVICE CARD



Take the BLAHS out of Church Publishing!

The most Christian clipart ever! 1000+ new, professionally drawn Christian images Old & New Testament, Church Activities, Christian Symbols, Maps plus more.

Great for your bulletins, newsletters, desktop publishing, Sunday School, books, greeting cards, etc.

Christian ClipArt CD-ROM™

Only \$49.95 + \$5 Shipping (US only)
All Major credit cards

800-729-9500

or send check or money order to
Ellis Enterprises, Inc.
4205 McAuley Blvd. #385,
Oklahoma City, OK 73120

Fax 405-751-5168
<http://www.christianclipart.com>

Runs on Win95/Win 3.1/DOS/MAC etc.
CIRCLE 585 ON READER SERVICE CARD



DATA RECOVERY

Lost your data? Don't panic CALL!

800-886-2231

Free evaluation!

- ◆ DOS
- ◆ Windows 95 & NT
- ◆ Mac
- ◆ Novell
- ◆ Unix
- ◆ OS/2

- ✓ 24-hour
- ✓ priority
- ✓ weekend
- ✓ on-site

- Virtually all operating systems
- Competitive prices
- Clean-room facilities

visit our Web site

DATA MECHANIX 18271 McDermott, Suite B, Irvine CA 92714
telephone: 714-263-0994 facsimile: 714-263-1549

OR CIRCLE 593 ON READER SERVICE CARD

MICROCOM

DATA RECOVERY SPECIALISTS.

When you Absolutely, Positively have to get your Data back... call Micro Com now for a free consultation.

800 469-2549

www.mcrecovery.com

818/881-7417 • 818/881-8015 Fax

CIRCLE 594 ON READER SERVICE CARD

The Data Recovery Experts.



Over 40,000 successful data recoveries performed.

Experts on every operating system and storage media.

Expansive data recovery clean rooms worldwide.

When it comes to recovering your critical data, bigger is better.

- 24-hour emergency service available
- Emergency & onsite services available
- 1988 Data Recovery Company International (Domestic & International) 100% success rate

Ontrack.
DATA RECOVERY
Mpls LA DC London Tokyo Singapore
800-872-2599
www.ontrack.com

www.ontrack.com OR CIRCLE 595 ON READER SERVICE CARD

DATA CONVERSION

If you want the most complete conversion services in the industry, just call...

(800) CONVERT

Capabilities include over 6000 formats
Data Recovery Services Available

PIVAR
COMPUTING SERVICES, Inc.®
165 Arlington Heights Rd. #M
Buffalo Grove IL 60089
(847) 459-6010
www.pivar.com

CIRCLE 596 ON READER SERVICE CARD

DATA RECOVERY

By Nick Majors' DATA RECOVERY LABS

Why do so many corporations, service technicians, small businesses & computer professionals insist on using Nick Majors and his team of experts for all of their emergency recovery needs? SIMPLE - We are just BETTER at what we do than anyone else in the world!

Nick Majors' DATA RECOVERY LABS
(TORONTO, CANADA / BUFFALO, NEW YORK)

The most technically successful facility available - anywhere - at any price!
Specializing in HIGH-END / TOP PRIORITY JOBS - including
Network Servers, Advanced Operating System problems,
Multi-drive RAID/ARRAY configurations, Optical Jukeboxes
and Tape / DAT recoveries

1.800.563.1167 www.datarec.com

www.datarec.com OR CIRCLE 596 ON READER SERVICE CARD

DATA RECOVERY IN HOURS

- Over 10 years of experience with clients worldwide (HP, NASA, & FedEx).
- We've recovered more than half-a-million megabytes of lost data.
- You only pay if there's a recovery.
- Call 24-hours a day.


LAZARUS
DATA RECOVERY
Working at the speed of business.
800-341-DATA
415-495-5556 • FAX 415-495-5553 • RESTRICTIONS MAY APPLY
381 Clementine Street • San Francisco, California 94103

CIRCLE 599 ON READER SERVICE CARD

CONVERSIONS DUPLICATIONS

TAPE 9-Track • 3480/90/90E • DLT • QIC • 8MM • 4MM
DISK CD-R • 8" • 5¼" • 3½" • 3"

Convert DP records/fields
Convert legacy WP
data via FTP site or BBS

800-357-6250

PHONE: 317-842-2077 EXT: 300
FAX: 317-842-8294
WEB: <http://www.shaffstall.com>
E-MAIL: support@shaffstall.com

Services & Systems Sales
SHAFFSTALL CORPORATION
Since 1973
7901 East 88th Street
Indianapolis IN 46256

www.shaffstall.com OR CIRCLE 602 ON READER SERVICE CARD

DATA CONVERSION

Tape • Disk • CDR • 4/8mm
Jaz • Zip • Cartridge • Modem
Multiple Operating Systems
Mainframe ↔ PC Data Experts
In a Rush? No Problem!

PROCESSING

Data Entry
Offshore option for large jobs
Mailing Services—including
Barcoding & Presorting
1099/W2/1098/1042S
Printing—Mailing—Filing
Superior SERVICE since 1970

800.533.4443
CHAIKEN SYSTEMS
370 7th Ave. New York NY 10001

CIRCLE 597 ON READER SERVICE CARD

Data Recovery

Win95+NT, DOS, MAC
Novell, OS/2

- FLAT RATE
- NO EVALUATION FEE
- 18 YEARS EXPERIENCE
- 24 HR. SERVICE AVAILABLE
- CALL US LAST!

800-339-3412

www.datarecovery.com OR CIRCLE 601 ON READER SERVICE CARD

DATA CONVERSION

DISKS • TAPES • CARTRIDGES
CONVERSION-DUPLICATION-SCANNING
MORE FORMATS THAN ANYONE

Quick • Reliable • Quality

WORD PROCESSORS, MINIS
MICROS, SPREADSHEETS
DATABASES, MAIL LISTS
IBM, DEC, APPLE, WANG
HP, WordPerfect, MS-Word
Lotus
Dbase
MICOM
LANIER
CPT, NBI

3480/3490, DC2120
8/4MM, XEROX, CP/M, UNIX

NATIONAL DATA CONVERSION
5 East 16th Street, New York, NY 10003
(212) 463-7511
AMERICA'S LEADERS IN DATA CONVERSION

CIRCLE 600 ON READER SERVICE CARD

WEB HOSTING

\$19.95
Per Month

- Unlimited E-mail Forwarding
- Domain Name Registration available (www.your_company.com)
- 1000 MB of Data Transfer per Month
- 50 MB Storage for HTML Documents and Graphics
- Full Redundant T3 Connection to the Internet
- Tons of Web Tools and Wizards
- Real Time Reporting on Web Site Activity
- Support for Custom CGI Scripts
- Reseller's Welcome

SLIPNET
254-7630
1-800-SLIP.NET
Int'l: 415-536-6192
www.slip.net
Order OnLine!

www.slip.net OR CIRCLE 603 ON READER SERVICE CARD

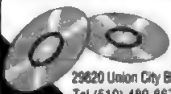
Software Duplication

Highest Quality Media & Equipment

- Software Mastering & Replication
- Printing: Custom Color Boxes, Product Packages, Labels, Manuals & Data Sheets
- Computer Components Testing, Product Assembly, Shrink Wrapping & Inventory Warehousing
- Prepress: Graphic & Package Design

Duplication 100% Guaranteed! Fastest Turnaround & Best Pricing

E-mail: apcsale@aol.com
http://www.apcasm.com



29620 Union City Blvd. Union City, CA 94587
Tel (510) 489-8677 Fax (510) 489-8678

TO ORDER CALL **800-666-1007**

CIRCLE 604 ON READER SERVICE CARD

Diskette and CD-ROM duplication. Packaging. Fulfillment. Internet/intranet distribution.

no surprises

When it's got to be right the first time, count on MEGASOFT. From reliable diskette and CD-ROM duplication, packaging and fulfillment to MEGASOFT Web Transporter™, the fast, powerful way to distribute software and documents over intranets and the Internet. ISO 9002 certified QMS.

FREE Project Planner Kit! Call 1-800-MEGASOFT (634-2763) today. Or visit us at www.megasoft.com.

819 Highway 33 East, Freehold, NJ 07728



CIRCLE 605 ON READER SERVICE CARD

DISKETTE DUPLICATION CD ROM REPLICATION PRINTING & PACKAGING WAREHOUSING DISTRIBUTION



Integrated Software Services

3822 WEST 1987 SOUTH • SALT LAKE CITY, UTAH 84104
801-975-9411 • FAX 801-975-9394 • 1-800-732-3475

CIRCLE 606 ON READER SERVICE CARD

Affordable DISKETTE & CD-ROM Duplicating Equipment

MAKE YOUR OWN COPIES

- Simple to Use.
- Super Reliable.
- A Snap to Set Up.
- Easily Pays for Itself.
- Free Media With Your Equipment Purchase.

BULK DISKS/CD-R'S

Verbatim • Dysan • TDK

DISKS: 3.5 LD or HD

Qty: 250+ 1000+

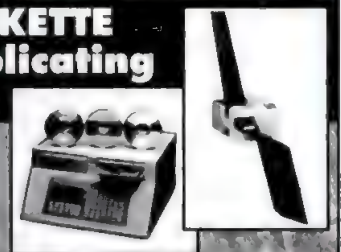
Blank .32 .28

Formatted .38 .35

CD-R's: 74 Min 50+ 200+ 500+

House Brand 6.29 5.39 4.99

TDK 6.99 5.99 5.49



**WE CAN ALSO DUPLICATE
CD'S AND DISKETTES FOR YOU**
24 hour turnaround Custom
labels & packaging. Highest
quality media. Total Quality
Assurance.

800-426-0247

Fax (908) 892-6186

PRINCETON DISKETTE

www.princetondiskette.com

1101 Richmond Ave., Pt. Pleasant Beach, NJ 08742

CIRCLE 608 ON READER SERVICE CARD

Design, Print and Apply CD Labels for \$79⁹⁵

That's NEATO!

- 1 Create your own artwork On Your Computer with NEATO Templates.
- 2 Print on Any Laser or InkJet using NEATO pressure sensitive labels
- 3 Using the NEATO Label Device, apply labels. PERFECTLY EVERY TIME!

Kit Includes

- NEATO CD Label Applicator
- Set of Assorted Labels & Inserts
- CD-FACE™ including Design Software (Mac/PC) and Background Art for Labels & Inserts
- Disc & Jewel Case Templates for Popular Graphics Programs (Mac/PC)

NEATO LLC 250 Dodge Ave • East Haven, CT 06512
800-984-9800 • 203-466-5170 • Fax 203-466-5178
Europe +44 (0)990 561571 • Fax +44 (0)181 932 0480
See us at <http://www.neato.com>



JEWEL
CASE
INSERTS
TOO!

NEAT

IMAGING
PRODUCT OF THE YEAR '96

VISA / MC / AMEX

CIRCLE 607 ON READER SERVICE CARD

RAPID REPRODUCTION

SIMPLE-FAST-SMART-RELIABLE
MANUAL DISKETTE DUPLICATORS
AX \$1,695 AS SHOWN



AX 1000-2000 SERIES

- FORMATS, COPIES, VERIFIES
- 360-5.25"/HR. - 180-3.5"/HR
- COPIES ALL MFM FORMATS
- RELIABLE TEAC DRIVES
- AVG. 100,000 COPIES/DRIVE
- STAND ALONE OPERATION
- 1 YEAR WARRANTY
- AUTOLOADERS AT \$2,195

**AXIOMATIC
TECHNOLOGIES
CORPORATION**

4995 Timberlea Blvd. Mississauga
Ontario, Canada, L4W 2S2
(905) 602 9270 Fax: (905) 602 9279

CIRCLE 609 ON READER SERVICE CARD

Everything CD-R

Personal Service. Low Prices

- Blank Media / Kodak, MTC
- TDK 74min - \$5.75
- Small volume duplication
74min - \$15.50
- Custom silkscreen printing
(done in-house) 3 colors
- Fast, Professional, Affordable
- CD-ROM replication

Your one-stop CD-R Shop

800-255-3142

Diversified Systems Group

206-392-0900 / Fax 206-392-5083

<http://dsagi.com> info@dsagi.com

CIRCLE 610 ON READER SERVICE CARD

Try our Recipes Yourself at Home!

Call us today and you'll be cookin' your own CD-ROM's tomorrow with the best ingredients in the business, like:

Mitsui Gold recordable CD-Rom media.

The only CD-R's in the world with a lifetime warranty. Try our 10-disc sample pack for only \$49.99, including our free overnight delivery! Call AMC today at 1-888-558-3108 and be sure to mention ad code PCM9C1 when ordering.

AMC Complete Multimedia Solutions.

ADVANCED MULTIMEDIA CONCEPTS
P.O. Box 3456 Redmond, WA 98073-3456
888-558-3108 www.pcm.amc-Direct.com

Call home today!
888-558-3108

www. OR CIRCLE 611 ON READER SERVICE CARD

PC MAGAZINE MARKETPLACE SHOPPERS BUY DIRECT.

IN THE LAST 12 MONTHS, OVER HALF OF THE COMPUTER PRODUCTS AND SERVICES THEY BOUGHT, THEY BOUGHT DIRECT.

ADVERTISE HERE, WHERE BRAND SPECIFIERS BUY DIRECT! CALL 800-835-4237 TODAY!

Source: 1996 PC Computing Marketplace Subscriber Study

Source: 1996 PC Computing Marketplace Subscriber Study

LIVE Interactive VIDEO CONFERENCING

Love is Hot

Adult 18+

24 hrs. • FREE pics & software
FREE Chat direct with our HOT babes!

www.loveishot.com

CIRCLE 618 ON READER SERVICE CARD

AUTOMATIC DUPLICATION EQUIPMENT

CD-R
Diskettes
HDD
FDD

Floppy & CD-R Printers, too!

Floppy Standalones from \$1695
CD-R Standalones from \$5495

OVER 13,000 UNITS INSTALLED WORLDWIDE!

888-723-3475
510-373-6060

CHAMPION championsms.com

www. OR CIRCLE 612 ON READER SERVICE CARD

CD-ROM DUPLICATION

- Same Day CD-R Duplication Labeling, and Insert Printing
- Extensive Premastering any format from any source
- Quick Turn CD-ROM Replication
- Turnkey Production of CD/CD-R
- Art/Film/Printing Services

DISC PRESS

for your FREE Guide to CD ROM Production visit our website

www.discpress.com

or call 888-311-DISC (3472)
203-759-0574 • Fax 203-759-0553

CIRCLE 615 ON READER SERVICE CARD

FREE! FREE! FREE! FREE!

THE WORLD'S LARGEST EROTIC CHAT NETWORK

http://www.4sex.com

FREE CHAT NETWORK
FREE CHAT NETWORK
FREE CHAT NETWORK
FREE CHAT NETWORK
FREE CHAT NETWORK
FREE CHAT NETWORK
FREE CHAT NETWORK

FREE CHAT AVAILABLE:
• STRAIGHT • GAY •
• LESBIAN • AMATEURS •
• FEMALES • S&M •

• NO DOWNLOADING •
• NETSCAPE BROWSER COMPATIBLE

http://www.4sex.com

Must be 18+

FREE! FREE! FREE! FREE!

CIRCLE 617 ON READER SERVICE CARD

ROCKY MOUNTAIN PLAYMATES

Live one on one Adult Videoteleconferencing on your PC

The hottest nude female Playmates at your command! Download our software and make your fantasies a reality tonight!

100-626-1111 X2222

Denver, CO Gold Key Network

www.rockymountainplaymates.com

CIRCLE 619 ON READER SERVICE CARD

Unbelievable !!!

- ▲ CD-R Duplicator LOADED \$1,995
- ▲ + "Signature" CD Color Printer \$1,295
- ▲ Upgrade to FULLY AUTOMATED \$2,995

Modular Expandable, Standalone

1-888-276-7992

Fax 510-417-2903
http://www.costas-systems.com
email: costasys@ix.netcom.com

www. OR CIRCLE 613 ON READER SERVICE CARD

AUTOMATIC CD-R & DISK Duplicators

Diskettes and CDR media at best prices

Diskette \$1,295
duplicators from

CD-R \$5,995
duplicators from

(510) 689-1695
fax (510) 689-1263
Lease, Rent, Trade-in
Email: copypro@dnai.com
www.copypro.com
CopyPro 1-800-887-9906

CIRCLE 616 ON READER SERVICE CARD

www.adultfantasies.com

WHERE YOUR FANTASIES BECOME YOUR REALITY

CIRCLE 620 ON READER SERVICE CARD

HOT PEEP SHOW

DIRECTLY FROM AMSTERDAM

- Peep at 100 different gorgeous girls and couples enjoying themselves.
- Interact with them.

The most striking shows you've ever seen

WWW.HOTPEEP.COM**BIZARRE**FROM SWAMP
HOT PICTURES

- FROM AMSTERDAM, UNUSUAL UNCENSURED HOT PICTURES
- ONLINE VIDEOS THAT YOU HAVEN'T SEEN ANYWHERE BEFORE
- MEET YOUR MATE IN THE FREE SWINGING AREA

WWW.BIZAR.COM

adults only 18+

CIRCLE 628 ON READER SERVICE CARD

LipstixLive Video Sex
Hot Young Florida
Babes Are Waiting
To Please You.Free 10 Minutes
Live One-On-OneFree 30 Minute
Peepshow**FREE PICS**www.lipstixxx.comOr For Free Disk
1-800-260-5124

Lesbian Shows Also Available

CIRCLE 626 ON READER SERVICE CARD

24
HRS

ADULTS ONLY

FREE VIDEO

24
HRS

**ORIENTAL
SEX PALACE
FANTASY ROOMS**
www.hotrotica

INTERACTIVE 1 ON 1 SEX ROOMS

- DOMINANCE
- FRENCH MAID
- POLICE CHICKS
- LARGE BREASTS
- TWO GIRLS
- INT'L MODELS
- COLLEGE GIRLS
- YOUNG NURSES
- BIKINI BEACH
- SEXY TEACHERS

LIVE BANGKOK STRIP SHOW - HOT!
NO START UP FEE • 30 MINUTE BLOCK REQUIRED

CIRCLE 621 ON READER SERVICE CARD

4sexfreaks.comLive Girls
No downloadsPicture gallery
1000's updates

Adult Video Clips

Adult Mail

Kinky Personals

Erotic Confessions

Erotic Chat Room

Unlimited Monthly Access

CIRCLE 622 ON READER SERVICE CARD

BABYLONX**RARE COLLECTORS PIX!**100% GENUINE
HARDCORE BEDROOM POLAROIDS
SNEAKY PAPARAZZI HOT-SHOTS!

- MADONNA HARDCORE SHOT!
- PRINCESS DIANA BARES ALL!
- PAMELA ANDERSON'S WEDDING VIDEO!
- AGENT SCARLETT'S PINK GULLY!
- CINDY CRAWFORD,
- BARBARA STREISAND

Don't miss out - get in NOW!
While they're still there!www.babylon-x.com

ADULTS ONLY - MUST BE 21 YEARS OR OLDER

CIRCLE 624 ON READER SERVICE CARD

**Hardcore
Underground
Sex Sites**

- STRANGE RARE PICS
- Updated Daily!
- 40+ Categories

- AMATEURS • BIZARRE • BONDAGE •
- BUSTY • CHEERLEADERS • HARDCORE •
- PUBLIC NUDITY • TS-TV • YOUNG GIRLS •
- Plus Many More!**

www.sexsites.com**LIVE SEX SHOW!**Live Girls-24 Hours
1-800-617-6699

Adults Only!

CIRCLE 627 ON READER SERVICE CARD

CLUB
Taj
MAHAL**CLUB TAJ MAHAL****"GIRLS"**Live Video-Conferencing
Here's your chance to
enjoy the beautiful

Taj Mahal Entertainers

Privately One on One
100% Live Totally Adult
EntertainmentVideo Conferencing
Featured in: Rolling Stone, New York
Times, CNN, NBC Real Life, XtraCALL NOW! Free 1-888-255-3555
Internet: <http://www.clubtajmahal.com><http://www.clubtajmahal.com>

CIRCLE 629 ON READER SERVICE CARD

FREE SEXY PICSFree Membership
to CyberPorn's Sampler Club

- FREE full-size weekly sexy pics
- FREE sexy CHAT. Streaming messages without special software!

CyberPorn ADULT ONLINE
MAGAZINE
www.cyberporn.comLive Nude Video
Teleconferencing! CyberPorn
(No Internet Needed)more than just strippers
We Offer What Others Don't:

- New 32bit PC software offers fastest frame rates and clearest picture.
- Hot two-girl show available!
- Rates 17% lower than competitors!
- Automated FREE registration
- High speed 33,600 baud rates
- Available 24 hours-a-day

Get 10 minutes free! (details on website)

Download FREE 32bit CP Live! software at
<http://www.cyberporn.com>
or download via modem at
1-800-609-2305

Adults only. *Based on recent survey of per min rates

CIRCLE 623 ON READER SERVICE CARD

**2 Live
Amateur
Lesbians**

Live 2 on 1 Adult
Videoteleconferencing
on your PC...Type or talk privately to
2 amateur lesbians at once while
you watch them tease and please
each other on your command.For a free disk, call
1-800-958-6770www.2livelesbians.com
BBS 203-596-2496

Must be 18+

CIRCLE 625 ON READER SERVICE CARD

LIVE SHOWS
**lesbian
&
gay**

sweethole.com

**lesbian
&
gay**

MUST BE 21 OR OVER

LIVE SHOWS**EXTREME SEX!**

[WWW.
naked
eyes
.com](http://WWW.nakedeyes.com)

(www.nakedeyes.com)

★★★★★

The hottest sexual experience on
the net. Nothing is held back!Live Peep Shows • Explicit Sex • Chat
Best Looking Models—Check it out FREE.

— FREE ADULT CD ROM OFFER —

For immediate satisfaction call:
1-900-745-8033

From \$2.49/minute. Must be 18+

CIRCLE 630 ON READER SERVICE CARD

PC Magazine's BusinessCard section is a forum for innovative, hard-to-find and low-cost PC products and services. Ads are listed by product category and include Reader Service numbers to allow fast, easy response.

RATES:

1 issue—\$1070, 3 issues—\$935, 6 issues—\$905.
12 issues—\$860, 17 issues—\$810, 22 issues—\$800.
Multiple-ad per issue rates also available. Prepayment must accompany each insertion. VISA/MC welcomed.

AD FORMAT:

PC Magazine will typeset each BusinessCard ad. Advertisers should furnish typewritten copy. Ads include:
1) Headline (1 line, initial caps=30 characters max, all caps=25 characters max), 2) Descriptive copy (5 lines, 225 characters max), 3) Company name (same specifications as headline), and 4) Address and telephone number (2 lines, 40 characters per line). No logos, artwork or camera-ready ads. Publisher reserves the right to edit supplied copy to meet section specifications.

DEADLINES:

PC Magazine is published 22 times a year, (bimonthly except for July and August). The BusinessCard closing is approximately two months prior to issue date.

Please send copy and payment to:
PC Magazine BusinessCard
One Park Avenue, 3rd Floor
New York, NY 10016
For more information, call 800-825-4237 or 212-503-5115, FAX: 212-503-5860.

HARDWARE/BATTERIES

Batteries/Tools for Mobile Professionals

Do your "2-HR" batteries only last 15 min? Try our long-life batteries, ac adaptors, car cords & chargers for Laptop, Cellular, Camcorder. Largest selection in the country! 1 Yr. Wmty. Low prices. Call 800-228-8374 for FREE battery guide/catalog.

1-800-Batteries

14388 Union Ave. San Jose, CA 95124
24hrs/7days • F408-879-1969 • www.800Batteries.com

CIRCLE 720 ON READER SERVICE CARD

GENERAL

HATE USING SCROLL BARS?

We say enough of that! See the difference of scrolling almost any window with your current mouse, without using your scroll bars!!

Download a 30 day FREE trial version at:

www.scrollingmouse.com

After trial period you can have it for \$19.97

SOFTWARE DUPLICATION

CD & DISKETTE DUPLICATION

- Quality Disk & CD Duping, low prices, fast turnaround
- Labels for CD & Diskette, Color printing on CD's
- CD & Diskette fulfillment. Let us send out your demo for you
- Great prices on quality high-cap media, call for current pricing

100% Guarantee on all products and services

DUP-TEK, Inc.

PO BOX 0, WELLINGTON, MO 64097
TOLL FREE (888) 939-3475 PHONE (816) 334-8518 FAX (816) 334-2500

PERIPHERALS

240volts/50Hz PRODUCTS

- EPSON • HEWLETT PACK • CANON • OKIDATA • APC
- Dealers inquiries Welcome • Lotus, Microsoft & more available in Spanish, French, Portuguese
- Awarded EXPORTER OF THE YEAR IN 1994
- FREE Catlg. 30,000 items • sales@intlhtech.com

International High Tech Marketing

12285 SW 129th Court, Miami, Florida 33186
Tel: 305-254-8731 Fax: 305-254-8736 Call Today!

CIRCLE 721 ON READER SERVICE CARD

RELIGION

Bible on Disk or CD-ROM

Full Featured...Fast and Friendly Bible Study Software. As the leader in Bible study software since 1981 we have continued to listen to our customers and provide them with the tools they need. FREE catalog www.brs-inc.com/bible

Bible Research Systems

2013 Wells Branch Pkwy. #304 Austin, TX 78728
1-800-423-1228 1-512-251-7541

Hand Your Business Card...

To 1,044,227 of the most qualified buyers in the PC market. These brand-specifiers are looking to buy while reading the industry's #1 publication. There is no more cost-effective or efficient way for you to build sales.

BusinessCard

Call your BusinessCard representative today.
1-800-825-4237

SOFTWARE/COMMUNICATIONS

FREE UNZIPPING SOFTWARE

Unzip with eZip! Download your free copy of eZip today
• Easy-to-use wizard interface
• Ability to unzip all ZIP files
• Store the directory/folder structure
• Multiple disk spanning, Drag & Drop capabilities
• Anti-Virus Support, Quickview Plus Support

ediSys Corp., Dallas, TX

<http://www.edisys.com>
e-mail: sales@edisys.com

CIRCLE 722 ON READER SERVICE CARD

DATA RECOVERY

DATA RECOVERY & CONVERSION

Don't PANIC!! call VOGON
Tape, Optical or CD Media

- Accidental Overwrites
- Hardware or Software Failure

VOGON

US Ph 405-321-2585 Fax 405-364-8242
UK+44-118-989-0042 Fax 0040

CIRCLE 724 ON READER SERVICE CARD

MARKETING POWER

Is yours when you place your message in this space. Reach 1,044,227 buyers of all kinds of PC products. Give your business card PC Magazine Marketplace Power.

BusinessCard

Call 1-800-825-4237 today.

DATA ENTRY

The Data Entry Emulator™

Full featured, heads-down data entry with two-pass verification, edit language, output record reformat, operator statistics, batch control, on-line help, free tech support, key from images (NEW!).
For PC, PC LAN, S/36, or AS/400.

Computer Keyes

21929 Makah Road, Woodway, WA 98020
800-356-0203/206-776-6443/Fax: 206-776-7210

STATISTICAL/RESEARCH

The Survey System for Windows

Analyzes: marketing, public opinion, customer satisfaction, employee attitude surveys. Handles mail, personal, phone, scanner, disk-by-mail, computer interviews. Records verbatim text/voice answers. Powerful, flexible, user friendly. Free support.

Creative Research Systems

140 Vista View #100, Petaluma, CA 94952-4728
Ph. (707) 765-1001/Fax (707) 765-1068
www.surveysystem.com

CIRCLE 725 ON READER SERVICE CARD

MULTIPLY—

Your sales by handing your business card to 1,044,227 buyers at one time in the place where they seek to buy—tell them about your product in PC Magazine Marketplace BusinessCard.

BusinessCard

Call your BusinessCard representative today.
1-800-825-4237

FOREIGN LANGUAGES/FONT/TRANSLATION

Foreign Language Software Leader

Largest selection of "Translation, Dictionary, Language Learning, Fonts, Word-Processing, OCR, Etc." from any company! Best prices, Satisfaction Guaranteed! Free 52 pg. Catalog. www.worldlanguage.com

World Language Resources

800-900-8803 Tel: 310-996-2300 Fax: 310-996-2303
2130 Sawtelle Blvd. Ste 304A L.A. Ca 90025

CIRCLE 723 ON READER SERVICE CARD

SERVICES/COMPUTER INSURANCE

Insures Your Computer

The COMPUTEROWNERS™ insurance policy repairs or replaces hardware, media and purchased software. Rates as low as \$49 a year covers theft, fire, accidents, power surge and more! Call for immediate coverage or info. 1-800-800-1492.

Safeware, The Insurance Agency Inc.

2929 N. High St., PO Box 02211
Columbus, OH 43202 1-800-SAFEWARE

CIRCLE 726 ON READER SERVICE CARD

Shake Hands

With 1,044,227 of the most qualified PC buyers in the market—right here—in PC Magazine Marketplace BusinessCard.

BusinessCard

Call your BusinessCard representative today.
1-800-825-4237



Advertising Sales Staff

One Park Avenue
New York, NY 10016
212 503-5100

DISPLAY ADVERTISING

Nancy Newman - Publisher
(212) 503-4453
**Peter Longo - National Associate
Publisher**
(212) 503-3849
Vickie Pinsky - National Sales Director
(212) 503-5651
Ad Systems Manager
Julie Eigo
(212) 503-5107
Advertising Coordinator
Jennifer Kim
(212) 503-5037

**Kimberly Jackson - East Coast Ad
Director**
(617) 393-3055

MA, NH, VT, ME, RI, Canada

District Sales Manager
Cameron Brown (617) 393-3058
10 President's Landing, Mystic Center
Medford, MA 02155
Senior Account Representative
Joyce Rossell
(617) 393-3054

CT, NY, NJ, NC

District Sales Manager
(212) 503-3703
One Park Avenue, 4th Floor
New York, NY 10016
Senior Account Representative
Beatrice Olivas (212) 503-5112

DE, MD, DC, VA, WV, SC, AL, MS, TN,
AR, KY, GA, FL, PA

District Sales Manager
Kevin Hein (212) 503-5176
One Park Avenue, 4th Floor
New York, NY 10016

Tim Castelli - Area Manager
(312) 214-7353

WI, IL, IN, MN, MI, IA, ND, SD, OH

Tim Castelli (312) 214-7353
150 North Wacker Drive, 25th Floor
Chicago, IL 60606
Account Representative
Katie Gillon
(212) 503-5011

TX, OK, LA, NM, CO, AZ, KS, NE, MO

District Sales Manager
RJ Kirkland (214) 360-5725
5956 Sherry Lane, Suite 625
Dallas, TX 75225

**Mike Kisseberth - West Coast
Associate Publisher**
(415) 547-8809

CA (Los Angeles), HI, NV

District Sales Manager
Stephanie Sload (310) 268-1381
11766 Wilshire Blvd., Suite 1550
Los Angeles, CA 90025
Senior Account Representative
Ed Beach
(212) 503-5113

CA (San Diego & Orange County)

District Sales Manager
Jeff Kamikow (714) 852-5920
18301 Von Karmen Avenue, Suite 330
Irvine, CA 92715

CA (San Jose), CO, ID, AK

District Sales Manager
Jennifer Hillis (415) 547-8816
50 Beale Street, 13th Floor
San Francisco, CA 94105
Account Representative
Jennifer Duddy
(212) 503-5024

CA (San Francisco & North),
WA, BC, OR

District Sales Manager
Jordan Klineman (415) 547-8807
50 Beale Street, 13th Floor
San Francisco, CA 94105
Account Representative
Brandon Lowitz
(212) 503-5047

CA (South San Francisco to
Mountainview), UT, WY, MT

District Sales Manager
Jon Schwartz (415) 547-8813
50 Beale Street, 13th Floor
San Francisco, CA 94105
Account Representative
Brian Gleason
(212) 503-5161

CENTRAL ADVERTISING

VP, Central Advertising
Robert A. Bader

Director of Sales and Marketing
Ken Holmstrom

Sales Manager
Bill Herbst

Production Director
Vicki Egan

Sr. Production Coordinator
Rob Scott

Sr. Advertising Coordinator
Marilyn Aldir

ID, MT, NV, OR, UT, WA, WY, AK,
Canada

Account Representative
Rachel Levy
(212) 503-3626

AL, AR, FL, GA, LA, MS, NC, SC, TN, WV,
KY, DE, DC, IL, IN, MD, MI, VA, WI

Account Representative
Jackie O'Hare
(212) 503-5138

CA (213, 310, 619, 714, 805, 818, 909), HI

Account Representative
Janet Fu
(212) 503-5132

CT, ME, NH, RI, VT, MA, NJ, PA, NY, OH,
Foreign

Account Manager
Patricia Nunez
(212) 503-3602

CA (209, 408, 415, 510, 707, 916)

Account Representative
Lisa Weseley
(212) 503-5118

CO, IA, MO, NE, AZ, KS, MN, ND, OK, SD,
NM, TX

Account Representative
Andrea Sachs
(212) 503-4579

**Business Card
Advertising**
Call: 1-800-825-4237
PC Magazine Marketplace
One Park Avenue, 3rd Floor
New York, NY 10016

**For more information
regarding *display*
advertising please call:
212 503-5100
1-800-33MAG AD**

**For more information
regarding *central*
advertising please call:
212 503-5115
1-800-825-4237**

contact
manager

technical
support staff

virus
killer

fax
machine

Need a better view?



UFO sighting? Not quite. It's our small business CD designed to save you time. Pop it in and you can test out four of our top-selling software solutions free for 30 days. It starts with ACT!™ which allows you to access customer information instantly. Then there's WinFax PRO™ for hassle-free faxing, right from



4 software products.
One dazzling CD.

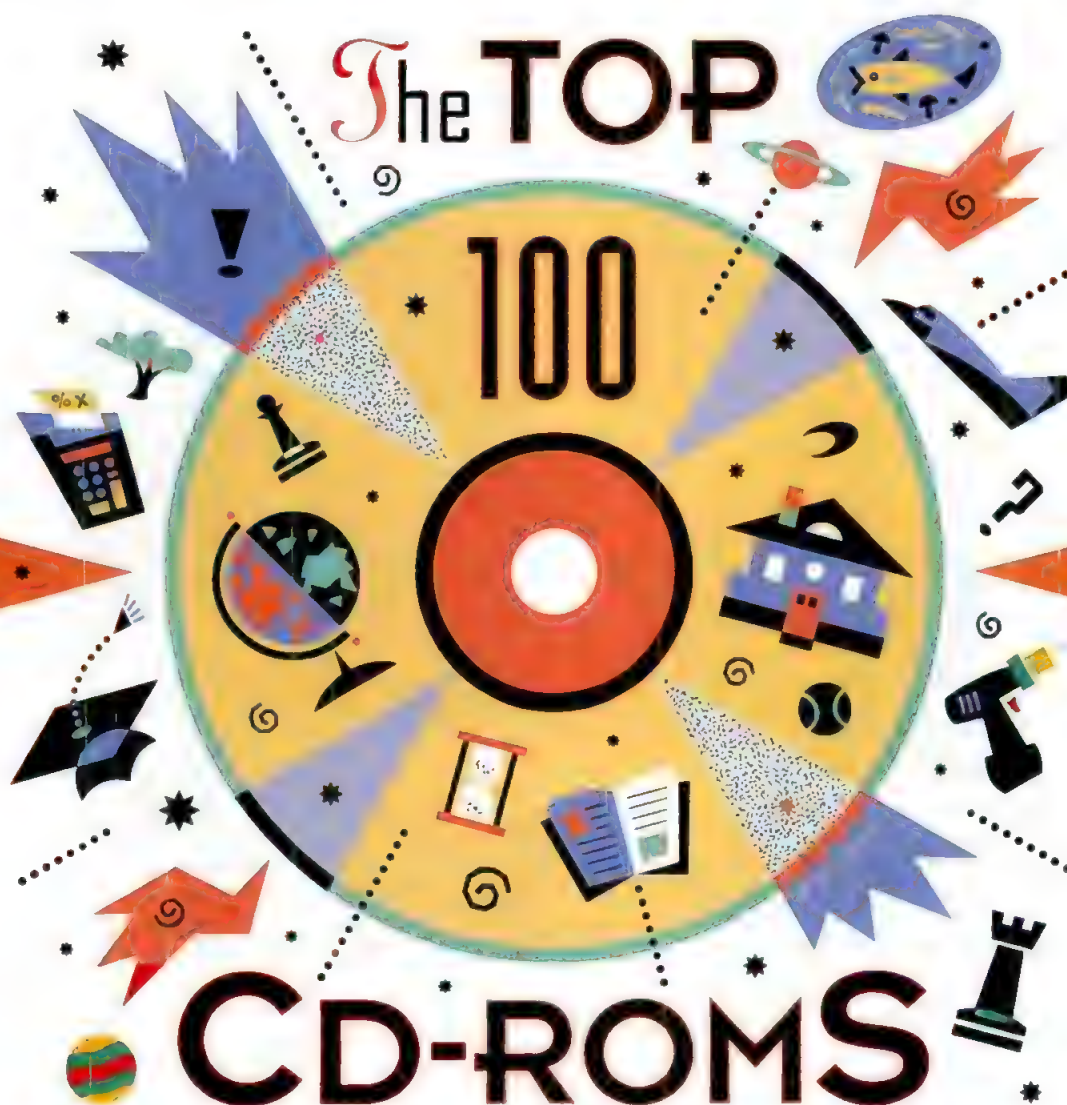
your computer. Norton AntiVirus™ to detect and remove viruses automatically. And finally Norton Utilities™, providing system protection against computer crashes. Four software programs that essentially save time. All so you can do more business. Can you see it now?

SYMANTEC.®

It's free. Call 1-800-835-6222 ext. 91119.

For additional product information or employment opportunities visit us at www.symantec.com. In Canada, call 1-800-365-8641. In Australia, call 02-9850-1000. In Europe, call 31-71-535-3111. Symantec, the Symantec logo, ACT!, WinFax PRO, Norton AntiVirus, and Norton Utilities are U.S. registered trademarks of Symantec Corporation. All other brand names and trademarks are the property of their respective owners. ©1997 Symantec Corporation. All rights reserved.

After Hours



IN PREPARATION FOR OUR fourth annual collection of the top 100

CD-ROMs available today, we cleared our hard disks and our schedules. You see, in order to assemble this final list of 100, our team of more than 25 reviewers needed first the time and then the disk space to install and evaluate nearly 400 CD-ROMs. We rated each CD-ROM in three broad categories: installation and setup, content, and delivery (or presentation to the user). The products in this story received the highest ratings.

We did not include business applications in this year's list, so you'll notice a definite home and personal-use theme throughout the story. Specifically, we se-

By Michael E. Ryan

lected the top titles in each of the following four categories: educational fun, games, home and hobby, and reference software. The "educational fun" category is further divided into two age groups, though many CD-ROMs are suitable for children in either. Within each category, the titles are presented in alphabetical order.

Another theme to notice: Many of these CD-ROMs take advantage of the Internet to enhance value—from online encyclopedia updates to multi-player death matches. All titles included in this list were published after May 1, 1996, and with the exception of a few DOS games, all run under Windows 95.

Educational Fun	366
Games	372
Home and Hobby	381
Reference	390

After Hours



EDUCATIONAL FUN

AGES 2 TO 8

A Color Clown Comes to Town (\$30 street; DiAMAR Interactive, 800-234-2627, www.diamar.com). Based on the book of the same name, this CD-ROM lets preschoolers color their way through an animated storybook and simple, easy-to-navigate games. Kids can mix different paints together and squirt them onto familiar objects. We especially liked the art center, which is chock-full of stamps, brushes, markers, and spray cans. Intended for

disneyinteractive.com). This interactive storybook guides children through Disney's feature-length cartoon *101 Dalmatians*. Learning games, sing-along songs, and clickable animations will entertain while teaching them reading, vocabulary, and problem-solving skills. The target age is from 3 to 7, but youngsters of all ages will enjoy helping to save the puppies from Cruella DeVil.—*Diane Jecker*

Disney's Ready to Read With Pooh (\$40 street; Disney Interactive, 800-900-9234, www.disneyinteractive.com).

What gentler way for preschoolers to learn their letters than from a teacher like Winnie the Pooh? New to the 100 Acre Wood, kids take up residence in a delightful treehouse. From there, they can ramble through the woods and play games that teach the alphabet, phonics, spelling, listening comprehension, and matching skills on three difficulty levels. After completing each level, kids earn a toy or other decoration for their treehouse.—*TFK*

Franklin Learns Math (\$30 street; Sanctuary Woods, 800-943-3664, www.ah-hah.com). Kids who adore cartoons will love this title, which features Franklin the Turtle and his cast of animal friends. The program contains six activities that are designed to teach ten math concepts, including recognizing numbers, counting, adding, subtracting, counting money, and telling time. Each activity is accompa-

nied by wonderful animations that are as good as any Saturday morning cartoon. The program's suggested age range is 4 to 7, but even children under 4 should be able to enjoy this title.—*Karen J. Bannan*

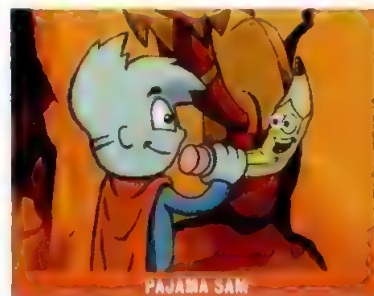
Franklin's Activity Center (\$30 street; Sanctuary Woods, 800-943-3664, www.ah-hah.com). This one is like a giant, virtual toy box: It has tons of exciting puzzles and games that will keep your children engaged for hours. They can do a jigsaw puzzle, play matching games or board games, follow a maze, play dress-up, color, or draw, all from the same easy-to-navigate interface. They can even play along with a friend, since most of the games accommodate two players. There's also stuff in here that parents may enjoy, such as Franklin's version of the classic Atari game Frogger.—*KJB*

Freddie Fish 2: The Case of the Haunted Schoolhouse (\$39.95 list; Humongous Entertainment, 800-499-8386, www.humongous.com). Captivating and full of fun, Freddie Fish 2 is an excellent animated adventure for kids and parents alike. Odds are, as you try to help your kids solve the mystery of the ghost in the schoolhouse, they'll be hooked on the many songs and hundreds of clickable animations.—*Michael E. Ryan*

Interactive Math Journey (\$50 street; The Learning Company, 800-227-5609, www.learningco.com). Tallycat and her friends are ready to lead your kids down the Math Path in search of the Math Magician. Along the way, they'll visit ten different lands, in which they can read a Math Tale, listen to a Math Song, or participate in a Math Exploration activity. This title also comes with a Math Activity Book, blocks, and interlocking

cubes so that children can get a firm grasp on patterns and spatial relations.—*Regina Kwon*

Pajama Sam in No Need to Hide When It's Dark Outside (\$39.95 list; Humongous Entertainment, 800-499-8386, www.humongous.com). The most challenging and visually stunning of Humongous's titles, Pajama Sam is one of the finest pieces of children's software we've ever seen. As you and your kids help young Sam get over his fear of the dark, you'll get



treated to fun puzzles, animations, jokes, and beautiful scenery. It may prove too complex for 2- and 3-year-olds, but even they will enjoy watching the game as you play it.—*MER*

Putt-Putt Travels Through Time (\$39.95 list; Humongous Entertainment, 800-499-8386, www.humongous.com). Something magical happens when kids play a Putt-Putt game, and this latest title is even more magical than most. After a time-machine mishap, Putt-Putt must search through the centuries for his lost pal Pep and all his school supplies. Along the way, you and your kids will enjoy the many songs, games, and characters you'll encounter. Another solid hit from Humongous and another title any good kids' software collection should include.—*MER*

Science Blaster Jr. (\$35 street; Davidson & Associates Inc., 800-545-7677, www.david.com). A great addition to Davidson's Blaster series, Sci-



Laura finds an old truck.
Can you paint a truck blue?

ages 2 through 6, this is best suited for 2- and 3-year-olds.—*Toni F. Kistner*

Crayola Magic 3D Coloring Book (\$40 street; IBM Corp., Consumer Division, 800-426-7235, www.pc.ibm.com/multimedia). This title proves that an electronic coloring book can be as much fun as the real thing. Kids can demonstrate their creative flair on 70 3-D pictures. They can use either fat or skinny strokes and choose whether or not to stay within the lines. Best of all, funny sounds accompany each stroke of genius.—*Mary E. Behr*

Disney's Animated Storybook, 101 Dalmatians (\$40 street; Disney Interactive, 800-900-9234, www

Our Contributors: JENNIFER L. ANDERSON, KAREN J. BANNAN, GLEN BOISSEAU BECKER, MARY E. BEHR, JAMIE BSALES, ROB DALY, CHRISTINA M. EVELYN, LAURA COX, ANGELA HICKMAN, DIANE JECKER, JAKE KIRCHNER, TONI F. KISTNER, YVONNE KOULOUTHROS, BRETT KRASNOVE, REGINA KWON, DAVID R. LAMBERT, JOSH LEVY, JAY MUNRO, MARGARET A. PIEMONTE, PAUL B. ROSS, RICK ROVEGNO, MICHAEL N. RUSIGNUOLO, NANCY SIRAPYAN, and S. JAE YANG are on staff at *PC Magazine*. T. LIAM McDONALD, SHANE MOONEY, and KATHRYN MUNRO are freelance writers. MICHAEL E. RYAN was the associate editor in charge of this story.

ence Blaster Jr. is designed to help foster the little Galileo in your child. The program is an impressive and mesmerizing effort containing five lesson units that teach kids about weather, weight, measurement, and magnetism, as well as other science topics. Once they're finished at the PC, they can continue to explore using the 30 experiments that are included in the software's companion book.—KJB

Stanley's Sticker Stories (\$30 street; Edmark, 800-691-2985, www.edmark.com). This title lets kids write their own stories while strengthening their reading, writing, communication, and creativity skills. Kids can piece together stories using over 300 virtual stickers—including a snake on a skateboard, a beach ball, and a sand castle—and pick from more than 15 locations. They even



INSIDE THE SAT & ACT '97 EDITION

have the option of animating the stickers or recording their own sounds for each character. When they're done, they can play the result back, print it, or save it for later.—MEB

Stellaluna (\$30 street; Broderbund Software, 800-521-6263, www.broderbund.com). This CD-ROM version of Janell Cannon's award-winning children's book of the same name will delight both parent and child. The interactive story of a lost bat who drops in on a nest of birds is beautifully drawn and narrated. Kids can settle back and listen, or they can jump right into the story, exploring the on-screen environment. The program ships with a copy of the book. The suggested age range is 3 through

7, but 2- and 3-year-olds should also enjoy it.—KJB

Tonka Construction (\$19.99 list; Hasbro Interactive, 800-638-6927, www.hasbro.com). In this CD-ROM, kids can get behind the wheel of the big rigs to run their own construction projects. As kids pave roads, build bridges, and erect skyscrapers, they'll sharpen problem-solving and creative-thinking skills. When the workday is done, they can even reward their faithful rig with an overhaul and paint job back at the garage. For each job completed, the supervisor rewards kids with a printable certificate.—TFK

AGES 8 AND UP

Algebra Smart (\$30 street; The Princeton Review, 800-566-7737, www.review.com). There's a big college bowl match on algebra coming up against the Pythagoreans. To prepare, students can join the amusing drill sergeant as he takes them through the entire Algebra I curriculum in an original, enjoyable way. A checklist tracks the percentage of the lessons and drills completed and the progress report tells students what and how they've done.—Brett Krasnowe

The Cartoon History of the Universe (\$24.95 direct; Human Code Inc., 800-659-5455, www.humancode.com). Based on Larry Gonick's comic books, these witty and informative history lessons will please all ages, though a few scenes involve fairly explicit sexual humor which parents may want to filter out for younger children (a parental-filter option is included). In addition, there are 17 activities, including an ancient board game against an Egyptian god, and a few online games and access to Internet chat rooms.—Michael N. Rusignuolo

Children's IQ and Achievement Test (\$39.95 list; Virtual Knowledge Inc., 800-301-9545, www.virtualknowledge.com). With Children's IQ and Achievement Test, you can track and assess over time your

child's development in math, language arts, science, and social studies. Designed for kids in kindergarten through third grade, the program's tests are chock-full of colorful graphics and nonthreatening cartoon characters who respond to kids with words of encouragement.—Angela Hickman

Geometry Blaster (\$45 street; Davidson & Associates Inc., 800-545-7677, www.david.com). This title makes learning geometry fun, even if the user happens to be a math-phobic high-schooler. Kids whiz through a space adventure solving problems to help save a planet. If they need a little traditional reinforcement, they can call on one of the program's strongest features, the Geometry Handbook. The handbook takes students through difficult concepts, showing them step-by-step instructions—complete with animations and examples.—KJB

Inside the SAT & ACT '97 Edition (\$30 street; The Princeton Review, 800-566-7737, www.review.com). Studying for college entrance tests may never be fun, but this title can make it a more bearable and successful experience. The Princeton Review has adapted material from its popular classroom-based course for this easy-to-use CD-ROM. Human instructors and cartoon students guide users through the program. Its irreverent humor helps spice up the lessons and can help keep teenagers interested.—MNR

InventorLabs (\$29.95 list; Houghton Mifflin Interactive, 617-503-4800,



www.hminet.com). It's not very often that one can snoop around the laboratory of Thomas Edison, James Watt, or Alexander Graham Bell. But this CD-ROM will let you do just that, teaching you about such inventions as the light bulb, the steam engine, and the telephone. Also, an interactive time line gives you a social perspective on these three inventors, showing what was happening in the rest of the world while these men changed our lives.—BK

JumpStart Adventures 3rd Grade: Mystery Mountain (\$40 street; Knowledge Adventure, 800-542-4240, www.adventure.com). Professor Sparks's bratty daughter Polly has sent 25 robots back in time in order to change history to match the wrong answers on Polly's failed history quiz. Kids team up with robot pal Botley to track down and stop each robot. The job takes sharp skills in reading, spelling, math, science, art, and music—but nothing a third-grader can't handle.—TFK

Major League Reading (\$29.99 list; Sanctuary Woods, 800-943-3664, www.ah-hah.com). For kids who can't get enough baseball, this program is a clever way to hone reading, spelling, and vocabulary skills. Pick the home and opposing teams, then play the game, answering baseball trivia questions to move the game forward. For extra help, kids can go to the





**A soft sizzle is replaced very
suddenly by pure adrenaline.**

That's True Digital Audio.



Call 1-800-258-3288



Technology should never get
in the way of reality. It should
enable it. Not interpret it.
It should allow an event to be
heard the way it happened.
That's what True Digital Audio
does. By delivering a pure
stream of digital signals to the
speakers, audio degradation
is virtually eliminated. And
pure sound comes through.

It's called True Digital Audio
for a reason. And it's only
from Altec Lansing.

www.altecmm.com

TRUE DIGITAL AUDIO®
|||||

After Hours

Coach's Corner, where they'll find spelling and vocabulary practice tests, a glossary of terms and concepts, and over 1,400 passages of baseball trivia and history.—*TFK*

Math Heads (\$29.95 list; Theatrix Interactive, 800-955-8749, www.theatrix.com). Instead of letting MTV take your kids away from their math homework, put a little math into their MTV. Using an interactive television metaphor, this title covers fractions, problem solving, computation skills, and pre-algebra through a combination of funky graphics, hip music, and a wicked sense of humor. The user first creates a math avatar, then takes part in the game's activities, where the avatar appears as a participant in different game shows.—*RK*



MathSoft StudyWorks for Schools (\$99.95 list, MathSoft Inc., 800-628-4223, www.mathsoft.com). Whether you're a high-school student looking for homework and test help or a teacher who dreams of creating better-looking exams, StudyWorks is the perfect study buddy. The title contains an extensive reference library on algebra, precalculus, calculus, and physics, along with a desktop publishing-style workspace. The program also contains a section on the SAT IIs, based on The Princeton Review's best-selling books.—*Laura Cox*

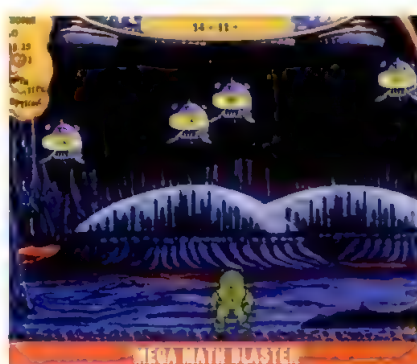
Mega Math Blaster (\$35 street; Davidson & Associates Inc., 800-545-7677, www.david.com). Like a set of adjustable training wheels, this title is designed to grow with your children and support them as they test their

nascent math skills. The two-CD set encompasses six years of learning, from simple addition to more advanced problem solving. You can track progress and even customize lessons, helping your children over any trouble spots.—*KJB*

Mighty Math Series (\$40 each, street; Edmark, 800-691-2985, www.edmark.com). This series teaches and reinforces math skills and concepts through fun games and activities. Number Heroes covers everything from addition and subtraction to simple geometry and probability concepts. Calculating Crew tackles slightly harder topics, such as money transactions, three-digit multiplication, and 3-D geometry.

Cosmic Geometry's darker, DOOM-like interface will keep older kids engrossed as they solve problems on 2-D and 3-D coordinates, surface area and volume, and simple algebra.—*RK*

Orly's Draw-A-Story (\$30 street; Broderbund Software, 415-382-4400, www.broderbund.com). Orly's Draw-A-Story combines four whimsical stories and a first-rate set of drawing tools with your child's imagination to create a wonderful, creative experience. Kids spend the day with Orly, following her adventures and manually drawing key elements that get integrated into her stories. In the unlikely event that your children grow tired of Orly's tales, they can create their own using the title's Story Book Maker.—*KJB*



Reading Blaster 2000 (\$35 street; Davidson & Associates Inc., 800-545-7677, www.david.com). Kids are sure to sharpen their reading skills while playing this title's four slick games, on three difficulty levels—but they'll be having too much fun to notice. Kids can play the games by themselves or challenge a friend or the computer in order to earn chapters in a story and certificates. Parental options let adults prioritize specific skill areas and track progress.—*TFK*

Smarty (\$35 street; Nicholson NY, 888-772-6877, www.spants.com). This offbeat CD-ROM teaches spelling, math, science, and music using superb animation, engaging stories, and a generous helping of humor. Mimi Smartypants, the heroine, is as unassuming and as real as CD-ROM characters get. And since you can interact with everything in her world, you never get that disconnected feeling often brought out by other kids' titles that try too hard to be hip. Smarty doesn't have to try very hard; it's already way beyond hip.—*KJB*

Someone's in the Kitchen! (\$35 street; DreamWorks Interactive, 800-426-9400, www.dreamworksgames.com). This colorful, musical program helps kids learn kitchen safety, food preparation, and measurement while demonstrating exactly what it takes to complete 28 different recipes. Kids can explore an animated kitchen and hum along with the program's 20 original songs. Though the title is intended for ages 4 through 7, we

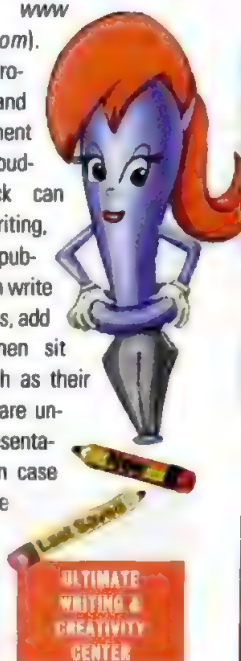
feel it is more appropriate for ages 6 through 10.—*KJB*

The Trigonometry Explorer (\$40 street; Cognitive Technologies Corp., 800-335-0781, www.cogtech.com). This program doesn't come with some of the multimedia glitz you'll find in other CD-ROMs, but it can still make learning algebra and geometry fun. Trigonometry Explorer teaches the ins and outs of degrees, angles, radians, triangles, right triangles, functions, plotting, and inverse functions. If you're looking for a usable, interesting way to improve your trigonometry grades, then this CD is for you.—*BK*

The Universe According to Virgil Reality (\$29.95 list; 7th Level, 800-884-8863, www.7thlevel.com). Professor Virgil Reality takes kids on a fun-filled, interactive multimedia journey through the world of science. Virgil creatively teaches children about dinosaurs, airplanes, the human skeleton, and many other subjects. In the activity center, Virgil walks kids through several experiments. The accompanying Columbia Encyclopedia is also an excellent learning tool.—*BK*

Ultimate Writing & Creativity Center (\$35 street; The Learning Company, 800-227-5609, www.learningco.com).

This program provides a fun and useful environment in which your budding Steinbeck can learn about writing, revising, and publishing. Kids can write their own stories, add illustrations, then sit back and watch as their masterpieces are unveiled in the Presentation Theater. In case kids have trouble getting started, the program offers several story-starter ideas.—*RK*



***New Price**
\$249
 With \$50
 End-User
 Mail-In
 Rebate

*Most Popular
 Personal
 Mobile
 Phone*



TWO MUST-HAVES FOR THE MOBILE PROFESSIONAL.

*Most Popular
 Personal
 Mobile
 Hard Drive*



THE SHARK 250™ MOBILE HARD DRIVE.

THE WORLD'S SMALLEST, FASTEST, EASIEST WAY TO TAKE YOUR DATA WHEREVER.

Smallest. Small enough to fit in your shirt pocket (290% smaller than other removable media drives). ▾ 2.5" 250MB removable HARDiskettes are rugged, smaller and easier to handle, transport and store. **Fastest.** Fast enough to run applications, as well as full motion video and audio (average seek time: less than 12msec). ▾ Transfer & backup data extremely fast; identical to hard disk performance. **Easiest.** Installs in less than 5 minutes. ▾ Unique parallel port set-up (with active pass-through) or PC card (PCMCIA) interface. ▾ Draws power from your computer; no wall outlet or power supply needed. ▾ Get the Shark 250 today, for only \$249* and own the most popular personal storage solution.

Shark 250
 MOBILE
 HARD DRIVE

Contact your local retailer (see below), call 888.GO.AVATAR (888.462.8282) ext. 301, or visit us @ www.goavatar.com

AVATAR
 PERIPHERALS, INC.

Fry's

COMPUSA

PC Mall

MicroWarehouse

FUTURE SHOP

Best Buy

Target

CIRCLE 172 ON READER SERVICE CARD

© 1997 Avatar Peripherals, Inc. Shark 250 and Shark are trademarks of Avatar Peripherals, Inc. All other company and product names are trademarks or registered trademarks of their respective holders.

After Hours

GAMES

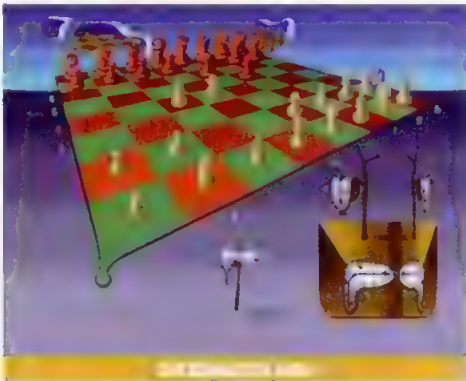
Chessmaster 5000 (\$45 street; Mindscape, 800-234-3088, www.mindscape.com). Move over, Deep Blue. With Chessmaster 5000 you can play against historical chess players like Bobby Fisher, design an opponent of your own skill level, and browse a database of 27,000 historical matches. You can even see what a past grand master might have done in a given situation. Combine all of this with top-notch graphics and you have a game that will both satisfy the novice and challenge the pro.—*Rick Rovegno*

Command & Conquer: Red Alert (\$54.99 list; Westwood Studios, 702-228-4040, www.westwood.com). With an intriguing plot, much-improved graphics, and cooler units to command, this sequel to last year's *Command & Conquer* is bigger and better than its predecessor in every way. You command an army of tanks, infantry, jets, subs, and other powerful weaponry in a real-time struggle against either computer or human opponents in fast-paced firefights.—*MER*

Crusader: No Regret (\$50 street; Origin Systems, 800-245-4525, www.origin.ea.com). Another sequel, this one follows up *Crusader: No Remorse* and packs an explosive punch. You again play the role of an assassin-turned-hero fighting a (seemingly) one-man war against the World Economic Consortium. This action game's crisp third-person graphics, 10 multilevel environments, 19 weapons, and 21 maneuvers form a

lethal combination that should please even the most discriminating action fan.—*MER*

The Elder Scrolls: Daggerfall (\$70 street; Bethesda Softworks, 800-677-0700, www.bethsoft.com). A fantasy role-playing epic, *Daggerfall* lets you assume the role of hero in a vast, 3-D virtual world filled with intrigue and danger. You can follow the game's plot or simply live out the life of your choice within the game. The graphics engine is low-resolution and pixelated, but still manages to immerse you



in the game world. *Daggerfall* has its faults and bugs (make sure you install the latest patch), but still it is an impressive piece of work and an addictive game.—*MER*

Diablo (\$50 street; Blizzard Entertainment, 800-953-7669, www.blizzard.com). Part action game, part fantasy role-playing game, Blizzard's *Diablo* has all the right ingredients: great graphics, simple but challenging game play, and phenomenal multiplayer options—including the easiest-to-use Internet play option we've seen. As you hack and slash your way through the game's 16 levels, you'll marvel at the eerie lighting and gruesome monsters even as you fire off a chain-lightning spell.—*MER*

Duke Nukem 3D: Atomic Edition (\$49.95 list; GT Interactive Software, 800-610-4847, [\[.com\]\(http://www.gtinteractive.com\)\). If the original Duke Nukem 3D didn't offend you, this version just might. Jam-packed with first-person shoot-'em-up action, this CD-ROM includes the original game plus an all-new multilevel episode called "The Birth"—trust us, it's gross. Other goodies include a screen saver, a Windows 95 desktop theme, and a level editor that you can use to create your own maps for Duke Nukem 3D.—*MER*](http://www.gtinteractive</p></div><div data-bbox=)



Goosebumps: Escape From Horrorland (\$45 street; DreamWorks Games, 800-426-9400, www.dreamworksgames.com). The CD-ROM sequel to R.L. Stine's popular *Goosebumps* book *One Day at Horrorland*, *Goosebumps: Escape From Horrorland* is spooky, scary, and just plain fun. The program features stunning visuals, challenging puzzles, excellent full-motion video sequences and performances by Jeff Goldblum and Isabella Rossellini.—*KJB*

Heroes of Might and Magic II (\$59.95 list; The 3DO Company, 800-336-5033, www.3do.com). One of the year's great sleepers, this fantasy/strategy game challenges you to raise and lead an army in a struggle between two rivals for a vacant throne.



You must recruit heroes and explore the land searching for resources with which to raise a powerful army. The graphics, music, and game play are all outstanding, and the included map

editor provides endless replay value.—*MER*

Interstate '76 (\$49.95 list; Activision Inc., 310-255-2000, www.activision.com). Games don't get much funkier than this one. Jump into the driver seat of your heavily armed muscle car and take to the streets as you battle a pack of auto-vigilantes to avenge your sister's death. The missions in this simulator-style game are very difficult, but they are also a lot of fun. The graphics are very good, and the uniquely animated cinematic sequences lend a tremendous amount of atmosphere to the game. For extended action, drive online to Activision's free I76-Net game servers.—*MER*

Longbow Gold (\$50 street; Origin Systems Inc., 800-245-4525, www.origin.ea.com). The most impressive flight simulation we saw all year, this helicopter sim includes the original AH-64D Longbow game along with the Flash Point Korea expansion pack. It may take you a while to get used to flying a chopper, but you'll have the time, as the game comes with over 400 missions. Excellent graphics and extensive reference material from Jane's Information Group round out this high-flying hit.—*MER*

Lords of the Realm II (\$60 street; Sierra On-Line, 800-757-7707, www.sierra.com). This game combines elements of *Civilization* and *Warcraft* into a single, compelling strategy challenge. Keep the peasants happy

"They thought my new multipath Back-UPS® Office™ was just a big surge suppressor – then the lights went out."

only \$180

Protection prevents surges from damaging internal or external modems, motherboards, input/output cards, and other system components.

Surge outlets guard your hardware with full-time surge protection. Three of the six outlets provide instantaneous battery back-up to keep your system from crashing in the event of a brownout or blackout.

Circuit breaker provides protection in the event of an overload or short circuit. No fuse, no hassle.

On/Off switch prevents accidental shut-offs and conveniently controls power to the entire connected system.

Convenient "BlockSafe" outlet spacing accommodates all size plugs, including large transformer blocks.

Back-UPS Office has user-replaceable batteries that can be easily swapped out, saving time and expense. No need to return to the factory for service. Batteries last 3-6 years under normal usage.

Back-UPS Office is available at the following locations:

COMPUTER CONNECTION **PC CONNECTION**

It's tough to get excited about a combination surge protector/uninterruptible power supply, but APC's Back-UPS Office is worthy of attention. Replace your present power strip with the Back-UPS Office and you'll sleep better.

\$30 REBATE

With the Purchase of a
Back-UPS Office

between August 1 and October 31, 1997.

Simply complete the attached redemption card and send along with an original UPC symbol from an APC Back-UPS Office box and the original store receipt with Back-UPS Office circled, and get a \$30 Rebate.

At last, a safe place to plug everything: multipath Back-UPS Office for workstations, PC's and peripherals



Power problems attack computers relentlessly. Did you know that you have a better chance of winning the lottery than of escaping power problems?

Power problems are the single largest cause of computer data loss and hardware damage.

Back-UPS Office provides clean, reliable power for your entire system. Instantaneous battery backup ensures uninterrupted operation of your CPU, monitor and an external storage device. Full-time surge suppression and site-wiring fault protection spreads a true multipath safety net under any remaining peripherals, like modems, printers, faxes and phone systems. Back-UPS Office also provides convenient BlockSafe® outlet spacing to handle all size plugs – even large transformer blocks.

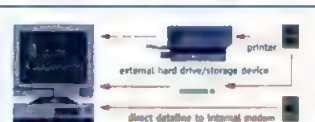
Unique multipath protection keeps your PC and data safe

Plugging phone lines or other peripherals into your computer increases your vulnerability to power

problems. When a surge hits an unprotected peripheral, it can blaze down serial cables and data lines, and toast your expensive PC. Multiple peripherals

and data lines to and from your system are vital, but dangerous. Without them you can't do your job. If a power sag locks your keyboard or reboots your computer before you've saved work, or while you are downloading from the Internet, you can lose data, time and money. Instead of increasing your risk by waiting, join over 8,000,000 satisfied computer users worldwide who prefer APC to protect hardware and data.

Multipath Means Total Power Protection



Bad power (red) can enter a computer system through multiple paths: eg. printer data and phone/fax lines – even if computer A/C is protected.



The Multipath protection of Back-UPS Office shields your peripherals and guards your computer from bad power on every path, providing clean, safe power (green) to your entire system.

Back-UPS Office protects your entire system

Until now, protection for your entire system required several devices. Back-UPS Office means clean, safe power to every peripheral, and instant battery backup to keep your system from crashing. It means protection for less by integrating the security of a surge suppressor with the power of a UPS, guaranteed up to \$25,000. (See policy for details)



See redemption card for more information. If redemption card is missing, please call APC Customer Service at (401) 788-2787. Or, if you have the coupon, call (401) 788-2787. Or, visit our website at <http://www.apc.com/english/promo/promo025.htm>. The coupon is valid at (401) 788-2787.

FREE SOLUTIONS GUIDE!

Just complete the information below and send to APC to receive redemption information regarding the \$30 Rebate Offer. We'll send you a Free 60 Page Solutions Catalog just for filling out the coupon!

- ☐ **YES!** Send me a \$30 Rebate Redemption Card.
- ☐ **NO,** I'm not interested at this time but please send me a free 60 Page Solutions guide.

Name: _____
Title: _____
Company: _____
Address: _____
City/Town: _____
State: _____ Zip: _____ Country: _____
Phone: _____
Brand of UPS used? _____ #
Brand of PCs used? _____ #
Brand of Servers used? _____ #

APC

Dept. E4-RB

(888) 288-APCC x8215

Fax: (401) 788-2787 • www.apc.com

Introducing:

COREL

WordPerfect Suite 8

The *New* Leader in Office Suites

The Reviews are in!

**Corel® WordPerfect® Suite 8
is a winner . . .**

"WordPerfect is back and better than ever . . . Its ease of use is phenomenal."

CNET, May 13, 1997

"Just when you think a product can't get any better, it does."

InfoWorld, May 26, 1997

"One element of WordPerfect hasn't changed: the file format, which supports backward compatibility."

Computer Retail Week, May 26, 1997

"... Corel's suite showed better integration between its applications and broader support for the Web . . ."

PC Week, April 28, 1997

**and this is what they're saying about
the competition:**

"Based on our discoveries, we're removing Office 97 and Outlook from the WinList."

Windows Magazine, June 1997

"Corel has priced its office suite so much lower than Microsoft's that I can't imagine enough of an incremental benefit in Office to cover the spread."

InfoWorld, February 24, 1997

For Windows® 95
and Windows NT® 4.0

\$139*

Upgrade CD-ROM version
After \$100 mail-in
rebate

Reseller may sell for less.



Communicate.

Collaborate.

Connect to the World.

Whether you're communicating over the Internet or with a simple letter, with words, numbers or graphics, Corel WordPerfect Suite 8 supports the medium that will drive your message home.

Collaborate easily with coworkers across the hall or associates on the other side of the world with the effective **collaboration** features in Corel WordPerfect Suite 8.

Experience technology that lets you go beyond traditional HTML layout limitations with the power of Java™. Thrive in a competitive environment with the dynamic Web features of Corel WordPerfect Suite 8 —and connect to the world.

**Available now!
Contact your local reseller.**

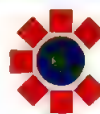
*US\$ plus applicable taxes and shipping.

CorelCENTRAL™ is not included in this release of Corel WordPerfect Suite 8. Customers will receive a voucher to obtain this application upon its release. Shipping and handling charges apply.

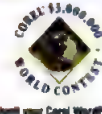
Copyright © 1997 Corel Corporation. All rights reserved. Corel, WordPerfect, Quattro, Presentations, CorelCENTRAL and the Corel balloon logo are trademarks or registered trademarks of Corel Corporation or Corel Corporation Limited. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. IBM and the IBM logo are trademarks or registered trademarks of International Business Machines Corporation. Netscape Navigator is a trademark of Netscape Communications Corporation. Java is a trademark of Sun Microsystems, Inc. All other product, firm and company names and logos are trademarks or registered trademarks of their respective companies.



Corel, Official World Title Sponsor
of the COREL WTA TOUR



Corel World
Contests and Shows



Submit your Corel WordPerfect
entry today!

To find out how to enter
visit our Web site at:

www.corel.com/contests



www.corel.com

Call now for a free demo disk!

1-813-728-0826 ext. 3000

Document # 1363

CIRCLE 207 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

**Small business is the backbone of America.
Announcing the backbone of small business.**



Introducing

NETCENTER™

- ✦ Networking hardware
- ✦ Amazingly simple to install & support
- ✦ Neatly stackable & compact
- ✦ Expandable
- ✦ Lifetime warranty & free support

There are two ways to sell a small business on networking. One, feed them watered-down versions of big-business products. Or two, the Dayna way. With products designed from the ground up for small business: simple, affordable, reliable, and well supported. Like NetCenter.™

NetCenter offers the things small businesses want. Like a stackable desktop design, expandability, cable management, a lifetime warranty, and toll-free support. NetCenter doesn't compromise performance either, with products like switches and Fast Ethernet hubs. Or a revolutionary Internet Station that provides Internet access with analog or ISDN connectors.

It's a new concept in networking, and we've bent over backwards to make it perfect for small business. After all, at Dayna, we've been networking small businesses for over a decade. To find out more, call 1-800-531-0600 for a product catalog, or visit www.netcenter.dayna.com.



Dayna.

CIRCLE 215 ON READER SERVICE CARD

Simple networking solutions.

www.netcenter.dayna.com

© 1997 Dayna Communications, Inc. NetCenter is a trademark of Dayna Communications, Inc.

COREL

PHOTO-PAINT 7

BEATS

Adobe® Photoshop® 4.0

"Photo-Paint is jam-packed with just about everything you'd want from a photo-editing program. And Corel has clothed it in an interface that assists rather than interferes with the creative process."

PC Magazine, April 22, 1997



April 22, 1997
Corel PHOTO-PAINT 7

Precision. Performance. Perfection.

It's official. Corel PHOTO-PAINT™ 7, an integral component of the award-winning CorelDRAW™ 7, is also a full-fledged, standalone image-editing powerhouse. More versatile, more intuitive and even more fun to use, this exceptionally reliable program recently won the prestigious PC Magazine Editor's Choice award. Delivering an exciting array of precision editing tools and a new level of flexibility, Corel PHOTO-PAINT 7 is leading the way in picture-perfect excellence.

Here's why:

SUITABILITY TO TASK: IMAGE EDITING SOFTWARE	Adobe Photoshop 4.0	★ ★ ★ ★ ★ Corel Photo-Paint 7	Fractal Design Painter 4.0	Macromedia xRes 3	Picture Publisher 7	QFX	Wright Image
POWER		★ ★ ★ ★ ★					
Editing and retouching	Good	★ ★ ★ ★ ★ Excellent	Good	Good	Good	Fair	Fair
Compositing	Good	★ ★ ★ ★ ★ Good	Good	Good	Good	Fair	Excellent
Painting	Good	★ ★ ★ ★ ★ Good	Excellent	Good	Fair	Poor	Fair
Output	Good	★ ★ ★ ★ ★ Good	Fair	Fair	Fair	Poor	Fair
EASE OF USE		★ ★ ★ ★ ★					
Editing and retouching	Good	★ ★ ★ ★ ★ Excellent	Good	Good	Fair	Fair	Good
Compositing	Excellent	★ ★ ★ ★ ★ Excellent	Fair	Good	Good	Fair	Good
Painting	Good	★ ★ ★ ★ ★ Excellent	Fair	Good	Good	Poor	Fair
Output	Fair	★ ★ ★ ★ ★ Good	Good	Good	Good	Fair	Good

PC Magazine, April 22, 1997

Outstanding Features:

POWERFUL FUNCTIONALITY

Create easy-to-edit objects and lenses as "layers" in a fully customizable user interface

GREAT PERFORMANCE

Internal memory management for fast and reliable editing of large images

MULTIPLE UNDOS AND REDOS

Up to 30 levels of automatic undos; unlimited list-based undos and redos

INTERNET SUPPORT

Browser-safe palettes, image map and transparent GIFs, progressive JPEGs and PNGs included

EFFECTS

Superior image adjustment and special effects filters

EDITABLE TEXT

"Live" text objects with line and spacing control

PAINTING

Natural media art tools, effects and clone brush types with sophisticated controls and pen/tablet support

FILLS AND TEXTURES

Transparent color gradients, seamlessly tiling bitmaps and computer-generated textures

SCRIPTS

Automate repetitive tasks by recording, editing and replaying commands and scripts

IMAGE SPRAYER

Real-time painting with full-color bitmap images

... and more!



Visit the location nearest you.

\$99⁹⁹

Competitive upgrade CD-ROM version



KUR-0459-US

Copyright © 1997 Corel Corporation. All rights reserved. Corel, Corel PHOTO-PAINT and CorelDRAW are trademarks or registered trademarks of Corel Corporation or Corel Corporation Limited. Adobe and Photoshop are registered trademarks of Adobe Systems Incorporated. All other product, font and company names and logos are trademarks or registered trademarks of their respective companies.

CIRCLE 011 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

After Hours

and keep your army strong as you struggle to gain control over medieval England. You get to build up your forces and govern your territories in a reasonably tension-free, turn-based mode, but the combat takes place in real time, so you'll have to keep your wits about you.—MER

Magic: The Gathering (\$65 street; MicroProse Software Inc., 800-695-4263, www.microprose.com). Magic: The Gathering is an excellent translation of the cult-classic card game of the same name. Choosing from over 400 cards, you can assemble a dream deck with which to duel the tough computer opponents. Alternatively, you can ven-

original MechWarrior 2 games, Mercenaries puts you in the cockpit of a hulking, three-story BattleMech—a walking robot armed to the teeth. If you survive, you can pick up a paycheck and salvage to support further missions. You can also hire comrades and call in air support to help out in a tough battle. You'll need them.—MER

NASCAR Racing 2 (\$55 street; Sierra On-Line, 800-757-7707, www.sierra.com). Like the original NASCAR Racing, this game is fun, realistic, and challenging. You can whip around 16 authentic race-tracks, and you adjust weather conditions, race length, and number of opponents. The game offers both arcade and simulation modes, and there's even a VCR option that lets you view replays from over 300 camera angles.—MER

The Need For Speed II (\$59.95 list; Electronic Arts, 800-245-4525, www.ea.com). Our favorite arcade-style racing title, this game lets you take the wheel of

some of the world's most exotic sports cars on a variety of tracks. The level of detail on the cars is spectacular, and the tracks are impressively detailed—and very difficult to master (especially with the oncoming traffic). Solid multiplayer options—including a split-screen mode—add to the game's appeal.—MER

The Neverhood (\$55 street; DreamWorks Interactive, 800-426-9400, www.dreamworksgames.com). Unique, challenging, and downright hilarious, this adventure game tells the tale of Klaymen, a hapless hero trying to figure out the mysteries of his world, the Neverhood. Besides the puzzles and the humor, the game stands out for its amazing look: The game's graphics were molded and animated entirely in clay. It can be tough and confusing at times, but that's all part of the game. This is definitely one of the year's best.—MER

NHL 97 (\$59.95 list; Electronic Arts, 800-245-4525, www.ea.com). Not a big hockey fan? You may be after playing this game. A finalist for our Awards for Technical Excellence last year, NHL 97 is one of the best sports games around. The outstanding 3-D graphics include realistic animations of checks, shots, and saves. The game play is fluid even with modestly equipped PCs, and the game's statistics tracking is solid enough to please most hard-core hockey fans.—MER

Obsidian (\$49.99 list; SegaSoft, 888-734-2763, www.segasoft.com). Stunning, surreal graphics and animation help this adventure game stand well apart from the crowd of Myst-alikes. It's a case of nanotechnology gone awry, as the satellite you designed becomes self-aware and sucks you into a bizarre world right out of your own nightmares. You'll have to work hard, think creatively, and possibly peruse a hint book to solve this game's many perplexing puzzles, but



the overall experience is well worth the effort.—MER

Quake (\$44.95 list; GT Interactive, 800-610-4847, www.gtinteractive.com). Aptly named, this gothic and gory action title shook the gaming market to its very foundations—and the shock waves are still being felt today. The game offers breakthrough 3-D graphics, hordes of demonic creatures, and the absolute best multi-



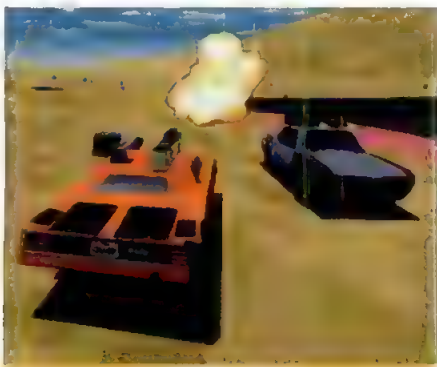
player shoot-'em-up action around. Quake's online following is nothing short of fanatical, and the game can be played over just about any Internet connection.—MER

SimPark (\$39.95 list; Maxis, 800-526-2947, www.maxis.com). From the makers of SimCity comes SimPark, an environmentally sound game. As a fledgling ranger, you choose the location and layout of a new park, then purchase flora and fauna to fill it. Then the real challenge begins, as you have to run the park and keep your boss happy. The unusual depth of this title makes it a great way to learn about other species and the environment.—RK

Steel Panthers II (\$50 street; Strategic Simulations Inc., 408-737-6800, www.ssionline.com). Yet another sequel, this outstanding game of tactical combat includes over 55 scenarios reflecting battles from the Korean War, Afghanistan, the Gulf War, and

other modern conflicts. Tactical combat is the name of the game here, so instead of huge armies, you control a host of individual units. The game is pretty easy to learn but intricate enough to keep you challenged.—MER

Tomb Raider (\$50 street; Eidos Interactive, 415-547-1200, www.eidosinteractive.com). Lara Croft, the heroine of this unique action-



ture into Shandalar, an action-adventure game-within-the-game where you wander the land challenging other wizards to duels. The only drawback: no multiplayer options—yet.—MER

Master of Orion II: Battle at Antares (\$65 street; MicroProse Software Inc., 800-695-4263, www.microprose.com). As emperor of your species, you start with a home world and decide how your species will expand throughout the universe. You'll have to deal with other civilizations as you move about the cosmos, deciding which to befriend and which to crush underfoot. Spectacular graphics, complex diplomatic options, and thrilling ship-to-ship tactical combat make MOO2 (as it is affectionately known) an extraordinary strategy game.—MER

MechWarrior 2: Mercenaries (\$49.95 list; Activision Inc., 310-255-2000, www.activision.com). Like the



Presenting the

56K

modems

that didn't

begin as

33.6 modems.

- NEW DATAPUMP & DAA
- FLASH ROM
- CUSTOMIZED FIRMWARE
- 4X SRAM PERFORMANCE
- DTE RATE TO 230 KBPS

**"THE BEST COMBINATION OF
FAST TRANSFER SPEEDS AND
CONNECTION RATES"**

PC WEEK



Visit www.diamondmm.com/56 now
to win a SupraExpress 56 modem!



SupraExpress and Supra PC Card 56 modems.

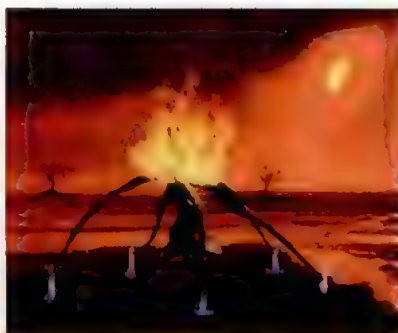
Unlike other 56K modems, Diamond Multimedia's affordable family of 56K modems were engineered from the ground-up to deliver the optimal 56K

performance. Instead of rebuilding existing 33.6 modems, we designed totally new components for 56K. Our new datapump, digital signal processor, and crystal are all faster than ever before. We've also added four times more SRAM to speed the process and we've doubled the DTE rate for the highest possible throughput. Finally, customized firmware optimizes each modem's speed and its ability to connect and stay connected. So call 1-800-727-8772 or visit us on the Web for the facts. Then prepare yourself to experience the ultimate in 56K.

SupraExpress and Supra PC Card are trademarks of Diamond Multimedia Systems, Inc. All other trademarks are the property of their respective owners. ©1997 Diamond Multimedia Systems, Inc. All rights reserved.



Accelerate your world.



adventure game, is like a female Indiana Jones—only tougher. As you guide her through 15 spectacular 3-D environments, you'll encounter a bizarre mix of enemies, traps, and other challenges. The game is played from a third-person perspective and places more emphasis on puzzle solving than gunplay, though you will need some firepower to make it through the game.—MER

ToonStruck (\$40 street; Virgin Interactive Entertainment, 888-843-2661, www.vie.com). Over two years in the making, ToonStruck is an entertaining adventure game filled with animated mayhem. You play a frustrated animator (portrayed by Christopher Lloyd) who gets drawn into his own cartoon world—Cutopia. To get back out, you must first restore Cutopia to cuteness by reversing the effects of the dreaded Malevolator. The game is funny and a refreshing break from the typical adventure fare.—MER

Virtual Jigsaw (\$19.95 list; each; SouthPeak Interactive, 800-774-6183, www.southpeak.com). Comprising four titles, the Virtual Jigsaw collec-



tion offers one- and two-sided puzzles with thousands of possibilities. There are three skill levels, but be warned: Anything past the easy level should really be played on a 17-inch monitor (or larger), because those pieces get awfully small.—MEB

X-Wing vs. TIE Fighter (\$55 street; LucasArts Entertainment Co., 415-472-3400, www.lucasarts.com). The long-awaited multiplayer *Star Wars* space combat game has a few flaws, but makes our list in spite of them. The game's fantastic graphics and game play make it incredibly addictive and enjoyable. Multiplayer options abound, though performance over the Internet can be iffy.—MER

You Don't Know Jack XXL (\$40 street; Berkeley Systems, 510-540-5535, www.berksys.com). You Don't Know Jack XXL continues the virtual game show's irreverent history, poking fun at pop culture and trivia and



the television programs that immortalize them. What's more, you can play the game against two other friends. You'll laugh and cry as the program's quick-witted host serves up double entendre questions, followed by biting put-downs when you get them wrong.—KJB

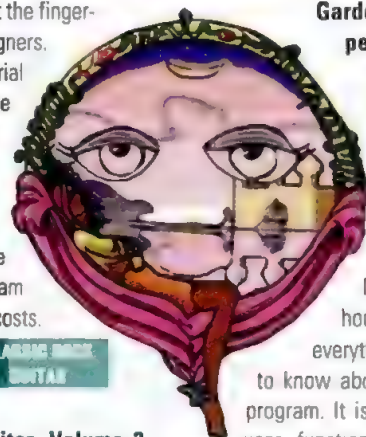


HOME AND HOBBY

Better Homes and Gardens Kitchen & Bath 2.0 (\$40 street; Books That Work, 800-242-4546, www.btw.com). Like Visual Home Deluxe (reviewed below), this program does an admirable job of putting powerful design tools at the fingertips of novice designers.

An introductory tutorial walks you through the initial kitchen and/or bath design, then you can tweak the design and add appliances. Along the way, the program tracks approximate costs.

—Jennifer L. Anderson



Garden Encyclopedia 3.0 (\$30 street; Books That Work, 800-242-4546, www.btw.com). In about 5 minutes, this CD-ROM teaches

home gardeners everything they need to know about using this program. It is simple, with

user functions limited to searching and browsing. A search form allows users to select a plant based on its attributes. Users can also save their findings with customizable plant lists and "personal notes" on each plant. From the glossary to the plant cards, all the facts are accessible with a mouse click.—JLA

Classic Rock Guitar, Volume 2 (\$59.95 list; Ubi Soft Entertainment, 800-824-7638, www.ubisoft.com). Following up on the original *Classic Rock Guitar*, this title is Beatles-only. The effective video/text/music/tab combination of instruction makes it easy for any intermediate (or better) guitarist to learn seven classic Beatles tunes: "Across the Universe," "Black Bird," "Let It Be," "Michelle," "Norwegian Wood," "Yesterday," and "You've Got to Hide Your Love Away." A record and playback function allows you to check your progress.—Jake Kirchner

Family Tree Maker, Deluxe Edition II (\$90 street; Broderbund Software, 800-474-8696, www.familytreemaker.com). This software can help organize your family names, dates, facts, and photos through a simple-to-use interface. The program includes four CD-ROMs of historical records—including marriage, military, and birth indexes—as well as

Gary Bernstein's Secrets of Professional Photography (\$30 street; DiAMAR Interactive, 800-234-2627, www.diamar.com). The latest in a series of terrific photography titles, *Secrets of Professional Photography* includes workshops on photography, composition and lighting basics, and advice on how to shoot men, women, children, and groups. In addition, the program's gallery holds over 400 of Bernstein's photos, with tips and technical information for each one. This is a great resource that you can return to again and again.—MEB

Put our labs in your machine

PC WEEK Windows PC Computing COMPUTER SHOPPER MacUser MacWEEK

Did you know you can test your computers using the very same benchmarks the Ziff-Davis experts do? Absolutely. You can run the same **scientific** performance tests that make our product reviews so reliable and so successful. You too will get dependable results. What's more, Ziff-Davis benchmarks incorporate **real-life computing** tasks. No wonder they're such a worldwide success.

With over **7 million** copies distributed in the last three years, they're the industry **standards** for measuring hardware performance.

Where do we get **objective** benchmarks of such high quality? We create them. Through the Ziff-Davis Benchmark Operation, the world's largest **independent** benchmark research and development team. Entirely dedicated to developing benchmarks you can trust.



Ziff-Davis Benchmarks: The Whole World Watches

ZD Ziff-Davis Publishing

Ziff-Davis Benchmark Operation, 1001 Aviation Parkway, Suite 400, Morrisville, NC 27560



Winstone*



WinBench*



NetBench*



ServerBench*



MacBench*

FREE!

BENCHMARK SOFTWARE

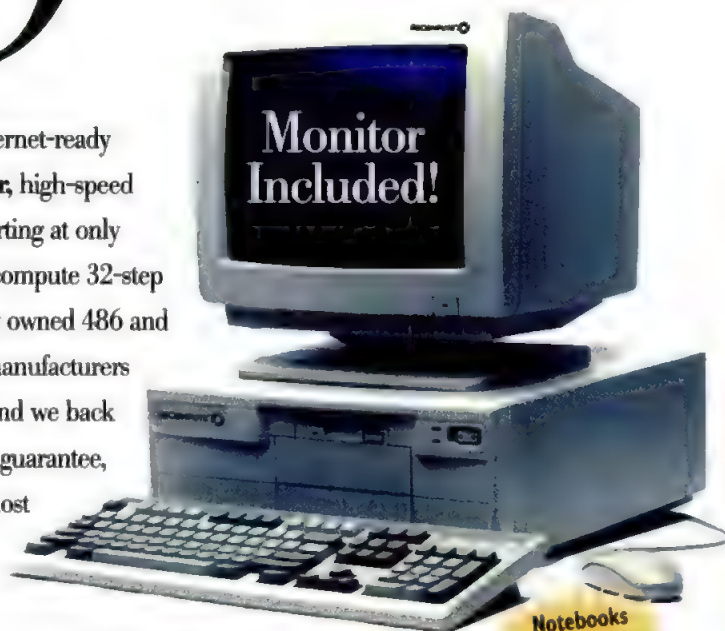
We can't test your machine in our labs, so we'll send our benchmarks to you free of charge. Full programs, not demo versions. We want everyone to make the best buying decisions possible.

You can download the benchmarks from ZD Net/CompuServe (GO ZDBOP) or from our World Wide Web home page at <http://www.zdnet.com/zdbop>.

Or, for a CD-ROM (\$5 each for shipping and handling) fax your credit card information to 919-380-2879 or send a check to ZDBOp. Allow 4 to 6 weeks for regular delivery or enclose your FedEx number.

America, say hello to the \$599 computer.

Recompute delivers a **complete** Internet-ready computer system **including monitor**, high-speed fax/modem and suite of software starting at only \$599. We perform our exclusive Recompute 32-step reconditioning process on previously owned 486 and Pentium® computers from leading manufacturers such as Dell®, Compaq® and AST®. And we back them up with a 30-day money-back guarantee, limited one-year warranty and the most heroic tech support in the industry. Call today!



Notebooks
and Servers also
available!



RECOMPUTE™

Rethinking the way the world computes.

To order, Call toll-free
1-800-358-5861

Mon-Fri 8 a.m. to 8 p.m. / Sat 8 a.m. to 2 p.m. CST

www.re-compute.com



Texas residents add 8.25% sales tax.

© 1997 Recompute. Stuff our lawyers want us to tell you: Prices valid in U.S. only and do not include shipping, handling and taxes. Configurations and product specifications may be changed at any time without notice. Recompute & Recompute logo are trademarks of Recompute Corp. All other brands and product names are trademarks or registered trademarks of their respective companies. No affiliation, connection, association, sponsorship, endorsement or approval has been obtained from the computer manufacturers and none should be implied.

CIRCLE 302 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

After Hours

HamCall U.S. & International

(\$50 list; Buckmaster Publishing, 800-282-5628, www.buck.com). With an interface only a ham could love, HamCall is nevertheless an essential addition to any amateur radio operator's shack. This comprehensive reference tool lets you pull up a name, radio address, license class and expiration date, and latitude and longitude for a given amateur call sign, among other things.—*Jay Munro*



How to Draw the Marvel Way

(\$29.95 list; Cloud 9 Interactive, 800-662-5683, www.cloud9int.com). This CD-ROM brings the secrets of drawing Marvel's famous (and infamous) characters to you in an enjoyable and compelling manner. Guided by Stan Lee, you learn form, shading, perspective, and artists' tips and tricks to help improve your drawings. You can also create posters, comic book covers, and trading cards with the Marvel heroes and villains.—*JM*

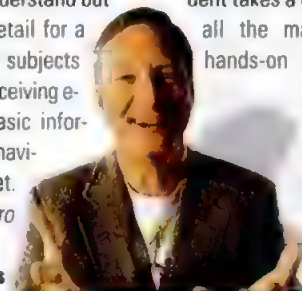
Kai's Power GOO

(\$50 street; MetaTools Inc., 800-472-9025, www.metatools.com). As digital photography goes mainstream, Kai's Power GOO helps us express our goofy side. GOO lets you manipulate images in funny and often bizarre ways. It also lets you create "Goovies," which are funky morph-like animations. The Fusion portion of the program lets you

mix and match parts of different faces and create a montage photo.—*S. Jae Yang*

Learn Netscape Navigator/Internet Explorer Quick and Easy

(\$19.95 list, each; Individual Software Inc., 510-734-6767, www.individualsoftware.com). These two titles provide step-by-step lessons that allow even beginners to get up and running on the Internet quickly and painlessly. The lessons are simple and easy to understand but provide enough detail for a thorough grasp of subjects like sending and receiving e-mail and other basic information needed to navigate on the Internet.—*Kathryn Munro*



MasterClips 150,000 Premium Image Collection (\$40 street; IMSI, 800-833-8082, www.imsisoft.com). With 14 CD-ROMs offering close to 50,000 photos, over 100,000 clip-art images, and 2,000 fonts, MasterClips 150,000 Premium Image Collection won't leave you longing for any more images. By navigating through any of the CD-ROMs' clear interfaces, you can easily find colorful, detailed images of people, places, and things; you can even find a variety of sound clips.—*Yvonne Koulouthros*

Master Cook Deluxe

(\$34.95 list; Sierra On-Line, 800-757-7707, www.sierra.com). Comprising eight cookbooks and one bartender's guide, this is one of the most comprehensive CD-ROM cooking guides we've ever seen. The interface is less than friendly, but the content, which ranges from basic to exotic recipes and includes a number of helpful video clips, is fantastic.—*MER*

Microsoft NT 4.0 Basic Training

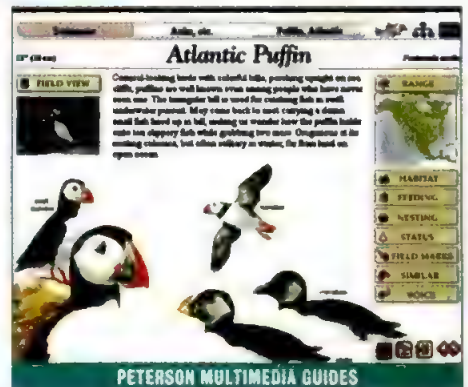
(\$219.95 list; Via-Grafix, 800-842-4723, www.viagrafix.com). This eight-CD-ROM tutorial gives a thorough look at installing and maintaining Windows NT 4.0. The title uses live-action video with narration, slides, and screen shots to walk students gently through most aspects of Windows NT. At the end of each disk, the student takes a comprehensive test on all the material. It's not real hands-on experience, but it's the next-best thing.—*JM*

Peterson Multimedia Guides: North American Birds

(\$69.95 list; Houghton Mifflin Interactive, 617-503-4800, www.hminet.com). This informative CD-ROM offers a wealth of information on nearly 1,000 North American birds, from puffins to pigeons. Detailed information on each bird includes habitat, feeding, nesting, range, and status. The highlight, though, is the collection of high-quality color photographs and over 700 bird calls and songs. You can also download free information updates or link to other birding resources on the Web.—*Nancy Sirapyan*

Tom Peters' Career Survival Guide

(\$39.95 list; Houghton Mifflin Interactive, 617-503-4800, www.hminet.com). This career toolkit provides more than good advice; it provides inspiration. It has all the basics: advice on drafting a killer résumé, self-administered "how am I doing" tests, insight into career-nurturing strategies, and even Web links. Then it goes the extra mile with plenty of multimedia—including energizing videos and funky music.—*Paul B. Ross*



Typing Instructor Deluxe (\$29.95 list; Individual Software, 510-734-6767, www.individualsoftware.com). Typing Instructor Deluxe certainly lives up to its title. This upscale self-teaching software makes learning how to type so entertaining that you'll improve your speed and accuracy without even realizing it. The program uses an airport terminal metaphor, with each lesson accompanied by pictures and music from different countries. You can even play a few "Virtual Adventure" typing games.—*Christina M. Evelyn*



Visual Home Deluxe

(\$60 street; Books That Work, 800-242-4546, www.btw.com). Visual Home Deluxe lets you design your dream house from top to bottom. The Quick Design Wizard guides you effortlessly through a basic blueprint, then you can drag and drop appliances and furniture into your design. Together, the intuitive editing tools, high-quality graphical interface, and integrated archive of brand-name materials make this powerful yet streamlined design tool a top choice.—*JLA*



TIRED OF MEDIocre PC VIDEO STILLs? GET STUNNING RESOLUTION WITH PLAY'S SNAPPY.™

Getting professional quality video stills into the PC has become a necessity, but until now, the great pictures you see on your video monitor have turned into mush on the way into your PC.

Now there's Snappy, the first video capture device designed by Emmy Award-winning broadcast video engineers. Snappy gives you breakthrough resolution - an astonishing 1500x1125 pixels (using actual 35 nanosecond samples). This record-breaking high resolution is made possible by the HD-1500, a custom chip Play's engineers designed specifically for Snappy.

Snappy has some of the most advanced video processing features found on any video digitizer at any price: software time base correction to provide consistently stable images; third order polynomial interpolation to give you maximum detail and sharpness; and proprietary image-processing algorithms to deliver vibrant, noise-free color images every time. This combination of technologies makes Snappy the best way to get perfect high-quality stills into your PC.

Now with Snappy you have a way to turn professional quality video into professional quality stills on your PC.

**SNAPPY VIDEO SNAPSHOT.™ AVAILABLE AT
COMPUTER STORES EVERYWHERE.**

\$199.95

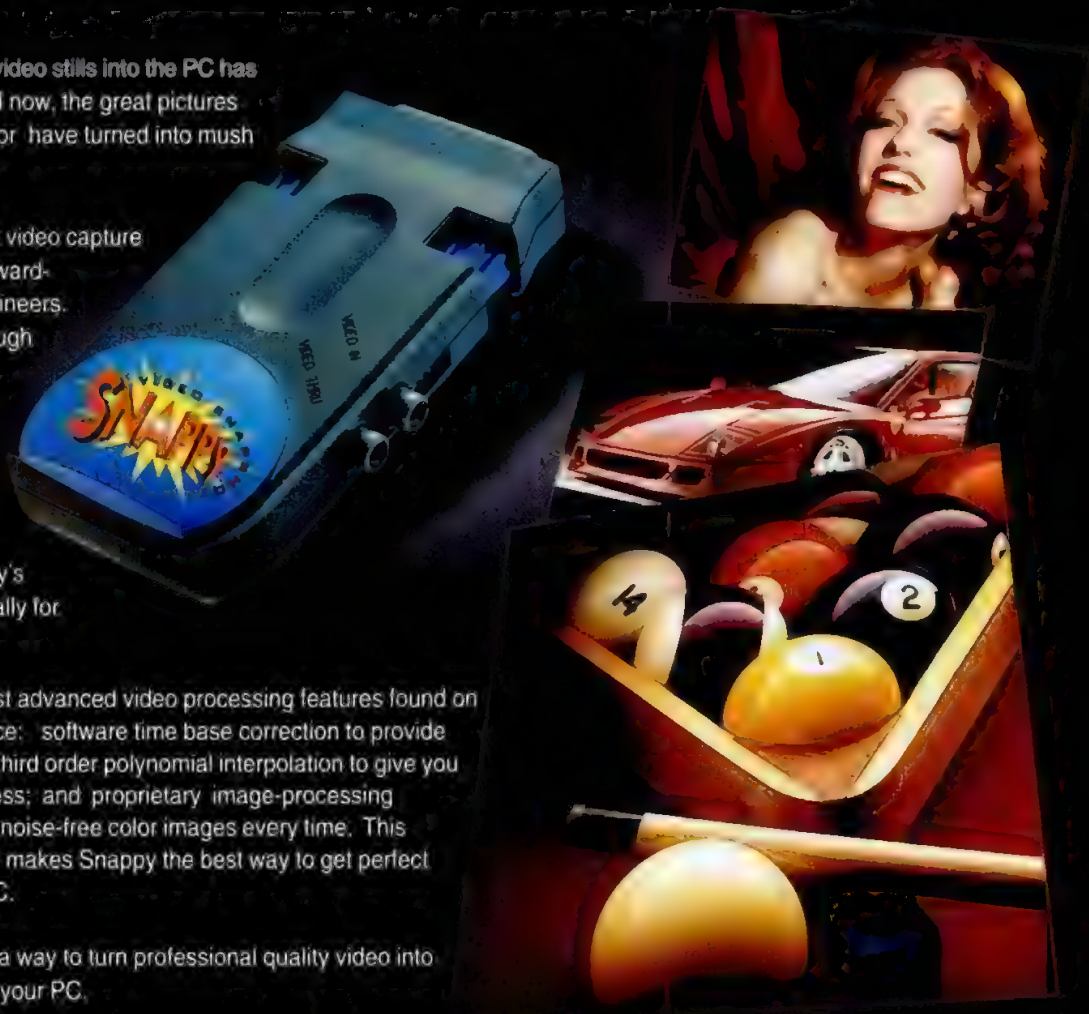
BONUS

We've added three powerful graphic software tools (worth over \$200) that enable you to take full advantage of Snappy's amazing image quality. Adobe PhotoDeluxe lets you create client presentations, storyboards, and promotional materials. Gryphon Morph is the same powerful morphing software used in "Bram Stoker's Dracula." The award-winning Kai's Power Goo SE gives you picture manipulation capabilities never before seen on a PC. CIRCLE 113 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

**Get The Free Snappy Demo @
www.play.com 800.306.PLAY**

We're looking for a few good nerds. If you're a zealot, if your life's passion is the work that you do, and if your current employer is sucking the life out of you, call Kid Stockhammer (Play co-founder and Director of Human Resources), and help us change the world.

Tiny lawyer warns: Play's Snappy and the Snappy logo are ours and thus trademarks of Play Incorporated. All other trademarks acknowledged. Play is a trademark of Play Incorporated. ©1997. All Rights Reserved.



You're looking at actual, unretouched Snappy digital captures from video.

PLAY
INCORPORATED

2890 KILBOME ROAD RANCHO CERRITOS, CA 94678
PHONE 916.851.0800 FAX 916.851.0801



Scanners

Pacific Image ScanAce III
•8.5" x 14" Flatbed scanner •36-bit color •Includes full Photoshop 4.0
\$899.99 after \$100 mail-in rebate
(PCF ACEIIIH-PC)
(rebate expires 9/30/97)

ScanAce II for PC w/ImagePals 2Go!
(PCF ACEII)
..... **\$349.99**

ScanAce II for PC w/full Photoshop 4
(PCF ACEIIH-PC)
..... **\$549.99**



Iomega Storage

Iomega Jaz™ Drive
External 1GB Disk Drive with Removable Cartridges
•Requires SCSI card •Includes 1 cart
\$399.99 (BER JAZEXTSCSI)

Iomega Zip™ Drive
External 100MB Disk Drive with Removable Cartridges
•Increase hard drive capacity
\$149.99 (BER ZIP100PAR)



Digital Cameras

Kodak

Kodak DC-25
Digital Color Camera
•2MB internal memory holds 14 hi-res or 20 standard images •Flash memory •24 bit color •6" color LCD screen
\$299.99 (KOD DC25)

Panasonic Egg-Cam Color Camera
(PAN GPKR001) **\$129.99**

Casio PhotoLab Digital Camera Outfit
(CAS PHOTOLAB) **\$399.99**

We stock the full line of RAYNOX lenses for Digital Cameras.

J&R COMPUTER WORLD

Corporate Leasing Available: 1-800-221-3191 (see below)

Toshiba Satellite 225CDS
with 133MHz Pentium® Processor

- 12.1" DSTN color
- 16MB EDO RAM
- 1.34GB hard drive
- 10x CD-ROM drive
- 16-bit stereo sound
- 2MB video memory

Lease for only \$74.00 a month!
\$1,899.99 (TOS PA1240U-56C)



Toshiba Libretto 50CT
Mini-Notebook with 75MHz Pentium® Processor

- Weighs just 1.85 pounds! •Fits easily in briefcase
- 16MB EDO RAM
- 810MB hard drive
- 6.1 TFT active-matrix color display

Lease for only \$80.00 a month!
\$1,999.99 (TOS PA1249U-T2A)



Toshiba Satellite Pro 445CDX
with 133MHz Pentium® Processor and MMX™ technology

- 12.1" FastScan color LCD display •16MB EDO RAM expands to 144MB •1.34GB hard drive •3.5" removable floppy drive •10x removable CD-ROM drive •16-bit stereo sound with .WAV and MIDI •2MB EDO video RAM

Lease for only \$96.00 a month!
\$2,899.99 (TOS PA1241U-H6C)

Toshiba Satellite Pro 445CDT

- 133MHz Pentium Processor with MMX technology
- 12.1" TFT color LCD •33.6Kbps voice/data/fax modem

Lease for only \$128.00 a month!
\$2,899.99 (TOS PA1241U-T6C)

The Intel Inside Logo and Pentium are registered trademarks and MMX is a trademark of Intel Corp.



Western Digital Caviar
5.1GB Internal Hard Drive
\$399.99 (WD 5100RTL)

2.1GB Internal Hard Drive (WD AC2100RTL) **\$229.99**

2.5GB Internal Hard Drive (WD AC2500RTL) **\$249.99**

3.1GB Internal Hard Drive (WD 3100RTL) **\$289.99**

4.0GB Internal Hard Drive (WD 4000RTL) **\$339.99**



Targus Cases

Air Targus
Universal Laptop Bag with Air Protection System
•APS puts a layer of pressurized air around your notebook for superior protection •Comes with extra pocket
\$99.99 (TAR CUN1A)

Universal Bag with Foam Padding
(TAR CUN1) **\$69.99**

Black Nitepac for Small Notebooks
(TAR CNO1) **\$39.99**



Tripp Lite

Tripp Lite Touchmaster
Internet-Ready UPS
•Battery backup/power management
\$189.99 (TRL TM-420)

500-Watt Battery Backup System
(TRL BC500PRSNL) **\$199.99**

675-Watt Battery Backup System
(TRL BC INT675) **\$269.99**

Super Notebook Protector
(TRL SHP) reg **\$19.99**

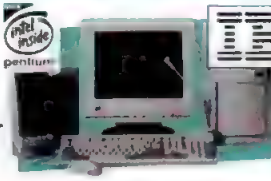
SMP FREE, if purchased with any of the above!

IBM® Aptiva® MiniTower with 233MHz Intel® Pentium® processor w/ MMX™ technology

- 32MB EDO RAM
- 4.2GB hard drive
- Built-in DVD player reads CD-ROMs
- 33.6/14.4 modem, upgradeable to 56K •Monitor sold separately

\$2,499.99 (IBM 2161-C3D)

Lease for only \$100.00 a month!
SEE DETAILS BELOW



IBM ThinkPad 765D
with 166MHz Intel® Pentium® processor with MMX™ technology

- 13" TFT color LCD screen
- 32MB RAM
- 3.0GB hard drive
- 8x CD-ROM
- 28.8/14.4 fax/modem

\$6,599.99 (IBM 9546-U9H)

Lease for only \$244.00 a month!
SEE DETAILS BELOW



Edutainment Software

Houghton Mifflin Inventor Labs™ Technology
\$16.99

Ardennes Offensive
by Mindscape **\$42.99**

Baby Felix Creativity Center
by 20th Century Fox **\$12.99**

Family Tree Maker (4.0) Deluxe
by Broderbund **\$84.99**

Hercules Animated Storybook
by Walt Disney **\$34.99**

Hercules Print Studio
by Walt Disney **\$22.99**

Inventor Labs™ Transportation
by Houghton Mifflin **\$16.99**

Interactive Magic Great Battles of Alexander
\$34.99

Mario Teaches Typing 2
by Interplay **\$29.99**

Math For The Real World
by Davidson **\$29.99**

Sail 2000
by Vivid Simulations **\$36.99**

Sim Park
by Maxis **\$29.99**

Smart Games/Word Puzzles
by RandomSoft **\$24.99**

Space Station Simulator
by Maxis **\$22.99**

Dragon Naturally Speaking
\$269.99

Continuous Speech Recognition
by NaturalSpeech

IntelliSynch for PalmPilot/Pilot
by Puma **\$49.99**

Kai's Photo Soap
by MetaTools **\$44.99**

Norton AntiVirus (2.0) Multi-Platform
Symantec **\$69.99**

Norton Utilities (2.0)
by Symantec **\$69.99**

Nuts & Bolts
by Helix **\$49.99**

Partition Magic (3.0)
by PowerQuest **\$64.99**

Business Software

Fractal Design Painter 5
\$249.99

Red Hat Linux (4.2)
by Red Hat **\$29.99**

Uninstaller (4.5)
by CyberMedia **\$39.99**

Virus Scan (3.0)
by McAfee **\$49.99**

VoiceType Simply Speaking
Gold by IBM **\$99.99**

WinFax Pro (8.0)
by Symantec **\$99.99**

WordPerfect Suite 8 upgrade
by Corel **\$159.99**

Microsoft Office 97
Small Business Edition upgrade
•Valuable suite of essential tools for small businesses
•CD for Windows 95, Windows NT
\$199.99 after \$40 mail-in rebate
(MSJ OFF97SBU C)

PLUS, with purchase of above, choose one of the following:
Timex Datalink Watch,
JIAN BizPlanBuilder Interactive,
or Microsoft Press Small Business Edition Training Kit

To Order Toll Free and Receive a Free Catalogue

24 Hours, 7 Days, Anywhere In The USA
800-221-8180
PARK ROW • NEW YORK • NY • 10038 FAX: 1-800-232-4432

MAIL ORDERS: J&R Computer World, Dept. CP0909
• 59-50 Queens Midtown Expressway • Maspeth, Queens NY 11378
CALL 1-800-221-8180 for shipping information. DO NOT SEND CASH.
Not responsible for typographical or pictorial errors. Some quantities may be limited. All merchandise brand-new, factory-fresh and 100% guaranteed!

J&R COMPUTER WORLD

Named RETAILER OF THE YEAR by Computer Retail Week



HP Printers

LaserJet 6140c
LaserJet Printer
•600-dpi print resolution •6-ppm
•Prints up to 8.5" x 14" (legal size)

\$349.99 after \$50 mfr. rebate
(HP C3994A) (good thru 3/98)

DeskJet 672c, B/W & Color •600 x 600 in black, 600 x 300 in color
(HP C5886A) **\$199.99**

DeskJet 870Cse, B/W & Color
•8-ppm black, 4-ppm color
(HP C4565A) **\$399.99**



Networking

3Com
3-User Network Starter Kit
•Includes OfficeConnect 8-port hub
three Ethernet-III ISA 10Base-T cards,
and three 50-ft RJ-45 UTP cables

\$299.99 (3COM 3C509028)

NDC Network Starter Kit (2 users)
(NDC ND772T) **\$79.99**,
after \$20 mail-in rebate
(rebate expires 10/31/97)

3Com Fast-EtherLink-XL 10/100
PCI NICard (3COM 3C905-TX) **\$89.99**



Monitors

Sony CPD-220VS
17" Multimedia Color Monitor
•16" viewable image •0.25mm dpi
•Built in subwoofer •For Sony CPUs

\$879.99 (SON CPD220VS)

Panasonic PanaMedia E50 (13.7" VHS)
(PAN E50) **\$299.99**

Panasonic PanaSync S70 (16" VHS)
(PAN S70) **\$599.99**

Panasonic PanaMedia PM17 (16" VHS)
(PAN PM17) **\$619.99**

BUSINESS LEASING: No Money Down, No Payments for 30 Days!

- 1) Allows flexibility to add or upgrade equipment at any time
- 2) Conserves your capital
- 3) Saves time, credit decisions are quick and easy
- 4) Covers entire packages - equipment, software, service contracts, and peripherals

*All lease payments are exclusive of applicable taxes.
Minimum leasing payment is \$50 per month. All leases
are subject to credit approval and require an adminis-
trative fee of \$49.95 to be billed on the first invoice.
Leasing program administered by Data Commercial
Credit. Leases are Business Leases, 50 down, 30
month term with \$100 purchase option.

Call J&R Corporate Sales
1-800-221-3191 or
1-212-238-9080
(24 Hrs. Minimum Lease Amount)

Compaq Armada 1130T TFT Color Notebook with 120MHz Intel® Pentium® Processor

•16MB RAM •1.0GB
hard drive •10.4"
TFT color display
•1.4MB diskette drive

\$1199.99 LIMITED QUANTITY
(CPQ 1130T)



SAVE \$100! PCMCIA 33.6 FaxModem
is **FREE** with purchase!!! (CPQ 262573 001)

Compaq Presario 2200 180MHz Desktop Computer

•16MB EDO RAM •1.6GB hard drive
•8x CD-ROM drive
•33.6K/14.4K bps
data/fax modem
•Stereo speakers and
Phantom subwoofer
•Black chassis
•Monitor required

\$799.99 (CPQ 2200)

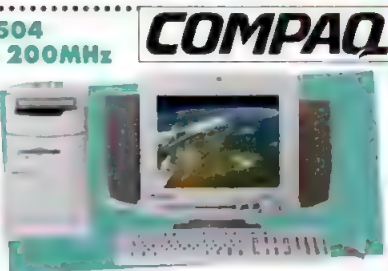


•V410 Monitor 13.2" viewable image
black matching finish (CPQ V410) **\$229.99**

Compaq Presario 4504 MiniTower Computer with 200MHz Intel® Pentium® Processor

•16MB SyncDRAM RAM •2.1GB
hard drive •16x CD-ROM drive •1.448B
disk drive •64-bit 3D graphics with MPEG
video •33.6/14.4Kbps data/fax modem,
upgradeable to 56Kbps for Internet down-
loads •JBL Pro speakers •Software bundle
includes Windows 95 •Monitor required

\$999.99 (CPQ 4504)



•Korea Data Systems 14" monitor, 0.28mm dot pitch **\$179.99**
Pentium, the Intel Inside and Pentium processor logos are registered trademarks of Intel Corporation

Hitachi VisionBook Plus 133MHz Notebook Computer

•12.1" high addressing
color STN LCD •1.44GB
hard drive •Removable
1.44MB floppy drive,
interchangeable with
10x CD-ROM drive
•33.6/14.4 Kbps
PCMCIA modem

\$1,799.99 (HIT 4140)



Lease 4140 for only \$72.00 a month!
SEE DETAILS BELOW*

Hitachi VisionBook Plus
•150MHz version (HIT 4150X) **\$2,499.99**

Hewlett-Packard Pavilion 8160 with 233MHz Intel® Pentium® processor with MMX™ technology

•32MB EDO RAM
•6.0GB hard drive
•24x CD-ROM drive
•33.6/14.4 data/fax
modem with K56Flex
download •Monitor
is not included

\$2,299.99 (HP 8160)



Lease for only \$92.00 a month!
SEE DETAILS BELOW*

M50 •15" monitor (HP M50) \$399.99
M70 •17" monitor (HP M70) \$699.99

Game Controllers



ThrustMaster Phazer Pad

\$39.99 (THR TMPHAZER)

Grand Prix 1 Racing Wheel
(THR GRANDPRX1) **\$79.99**

PFC Pro Flight Control System
(THR FLIGHTPRO) **\$119.99**

Formula T-2 Driving Control
(THR FORMULAT2) **\$129.99**

F-16 FLCs Flight Control System
(THR F16FLCS) **\$129.99**

Apple® Macintosh®



PowerBook® 1400CS/117

•117MHz PowerPC 603e processor
•11.3" DSTN color LCD screen with
800 x 600 max resolution •16MB
RAM •750MB hard drive •1.4MB
SuperDrive •6X CD-ROM drive

\$1999.99 (APP M5292L/A)

FREE Iomega Zip Drive
with purchase! Increase your
hard drive capacity with removable
100MB cartridges. (BER Z1P100SCS)

Personal Digital Ass'ts



Psion Series 5 Handheld Computer

•8MB RAM •Full VGA-width touch
sensitive screen with backlight

\$649.99 (PSN SERIES5)

Sharp YO-430 Personal Organizer
(SHA YO430) **\$69.99**

Compaq C120 Personal Digital Ass't
(CPQ C120) **\$299.99**

U.S. Robotics Palm Pilot, Pro Ed.
(USR 80201U) **\$399.99**



EPSON Stylus® Photo Color Ink Jet Printer

•Designed specifically for printing
photography •6-color technology
and true 720-dpi resolution •Smooth
gradients and virtually continuous
tone •Prints up to full 44" panoramic
images •Optional Adobe PostScript
Level 2 including Pantone Calibrated
approved colors •Microsoft Windows
and Macintosh compatible

\$499.99 (EPS C209011)

EPSON Printers



Stylus® COLOR 400 Ink Jet Printer

•720 x 720 dpi Photo Quality color
and laser quality black text •Prints
up to 4-ppm black and 3-ppm color
•Includes Look Your Best Color Pak

\$199.99 (EPS STYLUS-400)

Stylus COLOR 600 •1440 dpi
•8-ppm black, 4-ppm color
(EPS STYLUS-600) **\$299.99**

Stylus COLOR 800 •1440 dpi
•8-ppm black, 7-ppm color
(EPS STYLUS-800) **\$449.99**

PCMCIA Modems



Megahertz 33.6 Fax/Modem Card

•Connect directly to cellular phones
for fax and data communications

\$239.99 (MHZ XJ4336)

Motorola 28.8 Montana Fax/Modem
(MOT PCMC288MONT) **\$149.99**

EigerCom 56.6 PC Card Fax/Modem
(EGR EFX5660PL) **\$199.99**

Megahertz PCMCIA XJack 56K
(MHZ XJ1560) **\$269.99**

Order Your Free Catalogue Now!



To Order Toll Free and Receive a Free Catalogue

1-800-221-3191
24 Hours, 7 Days, Anywhere in The USA
PARK ROW • NEW YORK • NY • 10038

FAX: 1-800-232-4432

CIRCLE 295 ON READER SERVICE CARD OR GO TO WWW.PCMAG.COM/ProductLink

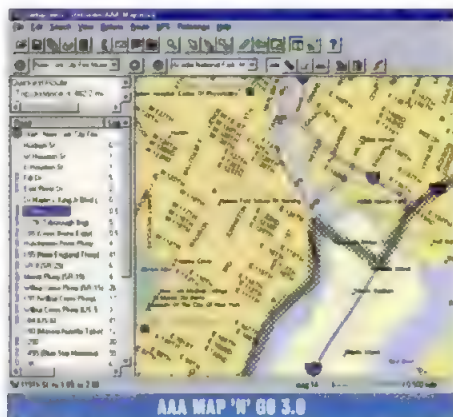
All Major
Credit Cards
Accepted

After Hours

REFERENCE

AAA Map'n'Go 3.0 (\$40 street; DeLorme Mapping Co., 800-452-5931, www.delorme.com). Despite close competition in the small field of CD-ROM trip planners, AAA Map'n'Go 3.0 stands out from the pack for its simplicity in performing its core task: giving good directions. It also allows you to download hotel, restaurant, weather, and road construction information from the DeLorme Web site. Other trip planners may be snazzier, but this one delivers the goods.

—Josh Levy



A.D.A.M.—The Inside Story 1997 (\$40 street; Mindscape Inc., 800-234-3088, www.mindscape.com). This how-it-works guide to anatomy lets you explore anatomy by clicking on beautifully rendered overviews of all the body's major systems. Alternatively, several animated video clips describe the major body systems and their functions. The "modesty" feature lets you block material you're not quite ready to have younger kids learn.

—Jamie Bsaes

American Heritage: The History of the United States for Young People (\$29.95 list; Byron Preiss Multimedia Company Inc., 800-945-3155, www.byronpreiss.com). This multimedia guide breaks American history

down into nine chronological sections, then fills you in with textbook-style articles. The product's virtual-reality tour of the subject matter is the most impressive feature. We should mention that the recommended minimum age of 6 is a bit low for the content.

American Sign Language Dictionary 2.0 (\$50 street; Multicom Publishing, 800-850-7272, www.multicom.com). A must-have for anyone interested in learning American Sign Language, this dictionary includes over 2,600 signs, with new ones available for download each month. Detailed descriptions, illustrations, and video demonstrations help you learn the correct way to perform each sign. A finger-spelling tutorial, learning games, and information on services and devices for the deaf and hearing-impaired round out

the impressive feature set.

The Atomic Files (\$34.95 list; L3 Interactive, 800-644-2823, www.learningcube.com). Using a creative user interface, this CD-ROM presents the user with a well-rounded history of the nuclear age. The title contains a wealth of primary sources, including classic newsreel clips, video from

the mass media during the Cold War, and interviews with important historical figures.

Britannica CD (\$300 list; Encyclopaedia Britannica Inc., 800-747-8503, www.eb.com). It doesn't serve

up the multimedia bells and whistles other encyclopedias offer, but it doesn't have to. This CD-ROM tome's 67,000 articles and 44 million words make for an invaluable research and reference tool. Also,

the interface is Netscape Navigator, so it's familiar to most folks.

Business Traveler's Suite (\$79.95 list; Rand McNally New Media, 800-671-5006, www.randmcnally.com). An impressive package and an incredible bargain, this four-CD set is as useful to average consumers as it is to businesspeople on the go. The bundle includes ABI's PhoneDisc along with Rand McNally's StreetFinder 97 (itself a Top 100 pick), Quick Reference Atlas, and TripMaker 97. Although running the suite as a whole requires a fair bit of disk switching, the user interface keeps things under control.

use this title with e-mail and text documents.

Escher Interactive: Exploring the Art of the Infinite (\$39.95 list; Byron Preiss Multimedia Company Inc., 800-945-3155, www.byronpreiss.com).



In addition to a complete gallery of M.C. Escher's work and a narrative of his life, this CD-ROM challenges you with two puzzles that will test your sense of perspective to the extreme. Rest your nerves afterwards with some delightful animations based on Escher's work, or dive into the complex, symmetrical pattern drawing program.

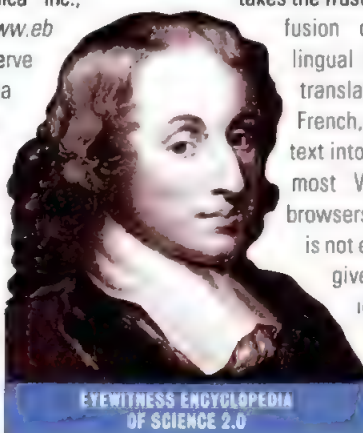
Exploring The Lost Maya (\$49.95 list; Sumeria Inc., 800-478-6374, www.sumeria.com). Using stills, animations, video clips and text, this title explores the nearly 3,500 years of the Mayan culture that was spread across Central America. Users can examine artifacts and buildings, learn about the complex Mayan calendar, take virtual tours of 37 Mayan cities, and even get directions on how to see the sites in person. This title is sure to please armchair archeologists.

Eyewitness Encyclopedia of Science 2.0 (\$40 street; DK Multimedia, 800-356-6575, www.dk.com). With features from an interactive periodic table to a "who's who in the world of science" list, this title should please any young science enthusiast. The program also offers 40 QuickTime movies, a satellite view of the Earth,

Easy Language: 17 Language Edition (\$30 street; IMSI, 800-833-8082, www.imsisoft.com). With Easy Language, you can learn the basics of 17 different languages with a single software package. Video, still images, and a simple but accurate voice recognition engine can help you learn key words and phrases. Day-to-day experiences like shopping, eating out, and sightseeing are used as examples. In all, the two CDs store over 17,000 words.

Easy Translator 1.0 (\$50 street; Transparent Language Inc., 800-332-8851, 603-465-2230, www.transparent.com). This package

takes the frustration and confusion out of multilingual Web sites by translating Spanish, French, and German text into English within most Windows Web browsers. The grammar is not exact, but it will give you a good idea of what's being conveyed by a given site. You can also



EYEWITNESS ENCYCLOPEDIA OF SCIENCE 2.0



In the future,
monitors will be
compact, powerful,
and flexible — like the
new Hyundai DeluxScan®
reduced-depth monitor.

The 17% reduction in depth offered by the Hyundai DeluxScan HL7870S makes the promise of a small footprint monitor a reality. This revolutionary new display has the viewing area of a standard 17" monitor in a smaller, lighter package. Yet, its state-of-the-art technology gives you uncompromising performance and features, including 1280 x 1024 resolution, .27 dot pitch, and Advanced Digital On-Screen Controls — all at prices comparable with today's classic 17" monitors.

Experience the future with a new Hyundai DeluxScan reduced-depth monitor. *It's the shape of things to come.*

For more information on the DeluxScan reduced-depth monitor, or any of the products in the DeluxScan monitor family, visit the Hyundai Web site at www.hea.com or call 1-800-568-0060



A 17" monitor with the footprint of a 14" monitor.

Model	CRT/Viewable	Max Resolution	Controls	Dot Pitch	ESP*
14S	14"/13.2"	1024x768	Digital	.28	\$189
15B	15"/13.7"	1024x768	Digital	.28	\$249
17MS	17"/15.7"	1024x768	Digital	.39	\$389
15G+	15"/13.7"	1280x1024	Digital On-Screen	.28	\$299
17B+	17"/15.7"	1280x1024	Digital On-Screen	.28	\$499
17S	17"/15.7"	1280x1024	Digital On-Screen	.27	\$599

*Estimated street price 6/97. Dealer prices may vary. Does not include shipping and handling.

(800) 568-0060

www.hea.com

HYUNDAI
DeluxScan® Monitors

After Hours

and a Quiz Master game that's a fun way to test what you've learned from the CD.—BK

History of Music (\$29.95 list; Zane Interactive Publishing, 800-769-3723, www.zane.com). From pre-Bach to post-rock, this four-disk set covers it all. Making excellent use of photographs and illustrations to supplement hundreds of music recordings, History of Music also provides succinct voice-overs, glossaries, and text to guide viewers through centuries of music. The material, which includes more than 5 hours of multimedia content, is suitable for students from grade school through adult.—JK

Home Medical Advisor (\$45 street; The Learning Company, Medical Library Division, 800-227-5609, www.learningco.com). This diagnostic guide to symptoms, diseases, and medications is as comprehensive as a medical reference text but much more accessible, even for adults without a medical background. In addition to matching symptoms with possible ailments, you can use the product to learn more about prescription and over-the-counter medications, first aid, poison treatment, and other medical conditions and procedures.—JB

Isaac Asimov's Library of the Universe (\$39.95 list; Zane Interactive Publishing Inc., 800-769-3723, www.zane.com). This six-CD set contains an entire semester's worth of information about astronomy and space exploration. You can browse the comprehensive index, but it's easier just to relax and sit back and follow the lectures, which come complete with detailed graphics and hyperlinks to related information. Then test your knowledge with a quiz at the end of each segment.—DRL



Life in the Universe: Stephen Hawking (\$39.95 list; MetaTools Inc., 800-472-9025, www.metatools.com). Listen as Stephen Hawking describes the latest theories on the evolution of life in the universe, accompanied by detailed diagrams and extensive background notes. Or explore on your own by following the enigmatic Phage on a tour of the mysteries of our cosmos. You can also jump online to find related Web pages, including Stephen Hawking's own "Life in the Universe" site.—DRL

Listings Deluxe (\$49.95 list; ProCD, 800-992-3766, www.procd.com). A great

tool for personal as well as professional use, Listings Deluxe certainly

lives up to its billing as "every resource listing you'll ever need." The 11-CD-ROM product contains a total of 250 million U.S. and Canadian residential and business listings, Web addresses, fax listings, census profiles, and ZIP code listings. And it gives you several ways to manipulate data by letting you tag, search, and export your findings.—YK

Microsoft Encarta 97 Encyclopedia Deluxe Edition (\$80 street; Microsoft Corp., 800-426-9400, www.microsoft.com). An easy-to-use interface and a wealth of information and multimedia content make this a good choice for your home reference library. Encarta's extensive collection of articles is supplemented by a dictionary, a world atlas, and a time line of world history. Encarta also has an impressive online com-

ponent that includes free downloadable updates and yearbook articles.—NS

Microsoft Encarta 97 World Atlas (\$55 street;

Microsoft Corp., 800-426-9400, www.microsoft.com). While other CD-ROM atlases may be easier to navigate, none has the wealth of richly colored maps and multimedia resources of the latest Encarta release. Its 14 different map styles provide images of everything from ocean floor topography to population density. The title also includes an extensive library of economic, political, and cultural information on each country and many cities, including musical samples from around the world.—JL

Origins of Mankind (\$24.99; Maris Multimedia, 800-336-2947, www.maris.com). It's hard to believe that a single CD-ROM could do a good job covering 70 million years of human ancestry in one sitting, but this one does. Among the many solid features is a section on the history of the theory of evolution, beginning with creationism and ending with the latest advances in molecular biology. All in all, this is a fun and educational title for anyone interested in our furry forefathers.—RD



Phone Search USA 3.0 (\$30 list; DeLorme Mapping Co., 800-452-5931, www.delorme.com). Packing a whopping seven disks' worth of material, Phone Search USA certainly delivers its promise to help you find any telephone number in the United States. An easy-to-use search function allows you to find and sort name, address, and phone-

number information in a variety of ways.—JK

The Ring Disc (\$99.99 list; The Media Cafe Publishing, 888-746-4347, www.ringdisc.com). Here is an ingenious guide to *Der Ring des Nibelungen*, Richard Wagner's grand cycle of four mythic operas. The disk includes a mono reproduction of Georg Solti's complete 15-hour recording, which you can hear while viewing a bilingual text, a piano/vocal score, and/or a running commentary. Numerous links let you explore the significance of over 120 recurring motifs, thus penetrating the intricate symbolism of this monumental sword-and-sorcery epic.—Glen Boisseau Becker

StreetFinder 1997 Edition (\$49.95 list; Rand McNally New Media, 800-671-5006, www.randmcnally.com). This well-designed product features a vast database of streets, addresses, and businesses across the continental United States. A straightforward interface and accurate, customizable maps also distinguish this package. A built-in link to the Internet provides up-to-date information on seasonal festivals, weather, and road construction.—JL

Travel Talk Spanish (\$40 street, The Learning Company, 800-227-5609, www.learningco.com). If you need a crash course in Spanish, you'll find Travel

Talk offers a fun and effective learning tool. The program uses an accurate speech recognition capability to evaluate your pronunciation, correcting you as you go. Also, a Travel Lab section presents you with realistic conversations at actual tourist attractions. These examples can help you grasp the language faster.—RR □

Point. Click. Shop!

[Welcome to the Corel Galleria]

File Edit View Go Bookmarks Options Directory Window Help

Back Home Reload Open Print Find

Location: <http://commerce.corel.com>

What's New? What's Cool? Destinations Net Search People Software

Corel Galleria™

Secure transactions†
Convenient Immediate
Anytime Anywhere
Downloadable products
Great Value!

Photos

Business

Clipart

Graphics Publishing

Screen Savers

Multi-Media

Internet

Games & Learning

Medical

Tutorials

Products

Corel® Photo Studio
Over 71,000 royalty-free professional photos

Clipart Collections
Creative images grouped together in theme packs

CorelDRAW™ 3 (Illustration Module)
Available to download at an incredibly low price

Corel® WordPerfect® Macros
Thousands to choose from

Screen Savers
A fun way to add personality to your workspace

Multilingual Software
Purchase products in the language of your choice, when available

H+A Collection
Exciting entertainment, education and reference titles on CD-ROM

H+A Medical Series
Comprehensive medical information

and much more!

† When using SSL technology (available in most browsers).
Copyright © 1997 Corel Corporation. All rights reserved. Corel, CorelDRAW, WordPerfect, Corel Galleria and the Corel balloon logo are trademarks or registered trademarks of Corel Corporation or Corel Corporation Limited. All other product, firm and company names and logos are trademarks or registered trademarks of their respective companies.

Document Done

COREL
www.corel.com

<http://commerce.corel.com>

Advertisers' Index COMPANIES

@ = OR GO TO WWW.PCMAG.COM/ProductLink

Reader Service No.	Advertiser	Page
134	01 Communique Laboratory.....	170 @
235	AMS Tech.....	41
297	ASP Computer Products.....	160
219	AST Research.....	26-27
122	AST Research.....	69
927	Accton Technology.....	NE35
087	Acer Peripherals America.....	92 @
092	Acer America.....	242-243 @
*	Adaptec.....	53
*	Adaptec.....	86
250	Adobe Systems Inc.....	180D
274	Adobe Systems Inc.....	259
064	Advanced Logic Research.....	286 W95 @
079	Advanced Micro Devices.....	98-99
081	Altec Lansing.....	368-369
915	American Power Conversion.....	NE9-NE11 @
341	American Power Conversion.....	373-375 @
172	Avatar Peripherals.....	371
*	Avery Dennison.....	261 W95
934	Axis Communications Inc.....	NE16 @
186	BayNetworks Inc.....	180A @
208	Brother International Corp.....	143
297	Cables to Go.....	160
292	Caere Corporation.....	8 @
177	Cardiff Software.....	270 W95
*	Compaq Computer Corporation.....	NE2-NE3
*	Compaq Computer Corporation.....	74-75
*	Compaq Computer Corporation.....	241
*	CompUSA Direct.....	311-315
275	CompuServe.....	237-239
360	COMPUTER DISCOUNT WAREHOUSE.....	54-55 @
188	COMPUTER DISCOUNT WAREHOUSE.....	56-57 @
109	COMPUTER DISCOUNT WAREHOUSE.....	288-289 @
159	COMPUTER DISCOUNT WAREHOUSE.....	290-291 @
318	COMPUTER DISCOUNT WAREHOUSE.....	292-293 @
158	COMPUTER DISCOUNT WAREHOUSE.....	294-295 @
129	COMPUTER DISCOUNT WAREHOUSE.....	296-297 @
332	Corel Corporation.....	22-23 @
037	Corel Corporation.....	376 @
207	Corel Corporation.....	189 @
011	Corel Corporation.....	378 @
041	Corel Corporation.....	394 @
*	Creative Labs.....	109
*	Creative Labs.....	111
095	Creative Labs.....	113 @
120	Crucial Technology.....	65 @
294	Cyber Media.....	167 @
343	Cyrix Corporation.....	38-39
018	Data Translation Inc.....	14 @
102	DataViz.....	277 W95 @
215	Dayna Communications.....	377
*	Dell Computer Corporation.....	C5-C8
*	Dell Computer Corporation.....	44
*	Dell Computer Corporation.....	184-185
*	Dell Computer Corporation.....	218-219
*	Dell Computer Corporation.....	234-235
*	Dell Computer Corporation.....	299 889
889	Deltec.....	NE31

Reader Service No.	Advertiser	Page
*	Diamond Multimedia Systems.....	380
283	Dirt Cheap Drives.....	305 @
*	EIZO NANA0 Technologies Inc.....	173
004	Epson America.....	12-13 @
240	ESRI.....	256 @
211	Executive Software.....	268 W95 @
272	First Source International.....	318-319 @
*	Gateway 2000.....	120A-120P
*	Hewlett Packard.....	15
*	Hewlett Packard.....	221
*	Hewlett Packard.....	223
*	Hewlett Packard.....	225
*	Hewlett Packard.....	227-229
*	Hewlett Packard SureStore.....	NE7
140	Hitachi.....	250 W95 @
143	Hitachi PC Corporation.....	82-83 @
005	Home Gate Inc.....	165 @
*	Hughes Network Systems.....	254
167	Hyundai Electronics.....	392
*	IBM Corporation.....	20
*	IBM Corporation.....	126-127
*	Imation.....	88
390	In Focus Systems.....	267 W95 @
278	Insight Direct.....	308-309 @
111	INSO Corporation.....	180B @
*	Intel Corporation.....	90-91
*	Iomega Corporation.....	194-195
*	Iomega Corporation.....	391
295	J&R Music World.....	386-389 @
135	JavaSoft.....	60-61 @
106	Kingston Technology.....	262 @
019	L.A. Trade.....	322
*	Leap Frog Lab.....	320-321
039	Mag InnoVision.....	18-19 @
855	Micro Solutions Computer Products.....	330 @
003	Micro Warehouse.....	326-327 @
*	Micrografx.....	59
203	Micron Electronics.....	5 @
098	Micron Electronics.....	16-17 @
164	Micron Electronics.....	48A-48J @
119	Micron Electronics.....	209-212 @
*	Microsoft.....	2-3
*	Microsoft.....	78-79
*	Microsoft.....	179
010	Midwest Computer Works.....	304 @
089	Mindspring.....	163 @
221	Mita Copystar.....	114
280	Mitsubishi Electronic America Inc.....	273 W95 @
179	MultiTech Systems.....	80
157	NEC Technologies.....	C2-C4, p1
217	NEC Technologies.....	31-34
155	NEC Technologies.....	122
156	NEC Technologies.....	201-204
153	NEC Technologies.....	214-215
300	NETCOM.....	169
266	Netgear.....	84
149	NetObjects.....	156-157
086	NewSoft Inc.....	285 W95 @

Reader Service No.	Advertiser	Page
118	Optiquet.....	153 @
*	Oracle Corp.....	11
047	PC Connection.....	324-325
330	PC Mall.....	300-301
080	PC Power and Cooling.....	94 @
068	PC Zone.....	306-307 @
014	Paragon.....	310 @
021	Phillips Business Electronics.....	187
193	Play Inc.....	385 @
125	PowerQuest.....	265 W95
176	PowerQuest.....	271 W95
287	ProGen Systems.....	130-131 @
132	Proxima.....	281 W95
884	QMS.....	NE33 @
074	Quantex.....	137-139
880	Quarterdeck Office Systems.....	NE15
302	Recompute.....	383 @
*	Ringdale.....	NE12
*	SPSS Inc.....	317
*	SPSS Inc.....	323
169	SafeGuard Interactive.....	161 @
146	Sceptre Technologies.....	260 W95
871	Seagate Software.....	NE13 @
271	Seagate Technologies.....	140 @
178	Shuttle Computer Group.....	104 @
*	Softbank Expos.....	97
335	Sun Microsystems.....	193 @
*	Symantec Corporation.....	155
*	Symantec Corporation.....	164
*	Symantec Corporation.....	364
316	Sys Technology.....	274 W95
174	Techmedia.....	190 @
*	Tektronix Inc.....	246
060	TeleVideo.....	251 W95
066	TigerDirect.....	283 W95
377	Toshiba America.....	174-175
378	Toshiba America.....	176-177
376	Toshiba America.....	196
379	Toshiba Japan.....	96
088	Traveling Software.....	266 W95 @
070	Trend Micro.....	NE5
242	UMAX Technology.....	70-72
055	Unicent.....	117-119
*	Unisys Corporation.....	232-233
006	Unisys Corporation.....	244 @
*	US Robotics Inc.....	50-51
*	US Robotics Inc.....	145-148
*	US Robotics Inc.....	NE19-NE29
051	USA Flex.....	316 @
243	Viagrafix.....	284 W95 @
117	ViewSonic.....	66-67 @
251	ViewSonic.....	253 @
*	Visio.....	129
065	VisionTek.....	43
085	Winbook.....	77 @
*	Xircom.....	25

* No Reader Service#. Please Call Advertiser For More Information.

Advertisers' Index PRODUCTS

Reader Service

No.	Company	Product	Page
ADD-ON BOARDS			
059	ATI Technologies	Graphic Boards	132
*	Creative Labs	AWE64 Gold Card	109
*	Creative Labs	AWE64 Gold Card	111
095	Creative Labs	AWE64 Gold Card	113
018	Data Translation Inc.	Broadway	14
AUDIO BOARDS			
*	Creative Labs	AWE64 Gold Card	109
*	Creative Labs	AWE64 Gold Card	111
095	Creative Labs	AWE64 Gold Card	113
BACKUP SOFTWARE			
815	American Power Conversion	Smart-UPS	NE9-NE11
341	American Power Conversion	Back-UPS Office	373-375
BRIDGES/ROUTERS/GATEWAYS			
215	Dayna Communications	NetCenter	377
CAD/CAM			
243	Viagrafix	Design CAD97	284
CD-ROM			
*	Adaptec	CD-R	86
934	Axis Communications Inc.	AXIS CD ROM Server	NE16
CHIPS/PROCESSORS			
079	Advanced Micro Devices	K6 Microprocessor	98-99
343	Cyrix Corporation	Cyrix 686MX Processor	38-39
106	Kingston Technology	Memory	262
COMMUNICATIONS SOFTWARE			
134	.01 Communique Laboratory	Communicate!	170
871	Seagate Software	Seagate Software-NSMG	NE13
COMPUTERS/COMPATIBLES			
235	AMS Tech	AMS Tech TravelPro 2000 Notebooks	41
219	AST Research	Bravo PC	26-27
064	Advanced Logic Research	Systems	286
*	Compaq Computer Corporation	Sys Systems (Switches)	NE2-NE3
*	Compaq Computer Corporation	Presario	241
*	Compaq Computer Corporation	Compaq Brand	74-75
*	CompUSA Direct	Mail Order	311-315
109	COMPUTER DISCOUNT WAREHOUSE	Hardware	288-289
159	COMPUTER DISCOUNT WAREHOUSE	Hardware	290-291
318	COMPUTER DISCOUNT WAREHOUSE	Hardware	292-293
158	COMPUTER DISCOUNT WAREHOUSE	Hardware	294-295
129	COMPUTER DISCOUNT WAREHOUSE	Hardware	296-297
360	COMPUTER DISCOUNT WAREHOUSE	Hardware	54-55
188	COMPUTER DISCOUNT WAREHOUSE	Hardware	56-57
343	Cyrix Corporation	Cyrix 686MX Processor	38-39
*	Dell Computer Corporation	Notebooks/PCs	C5-C8
*	Dell Computer Corporation	Dimension	184-185
*	Dell Computer Corporation	Latitude	218-219
*	Dell Computer Corporation	Latitude	234-235
*	Dell Computer Corporation	Latitude	299
272	First Source International	Memory, Notebooks, Peripherals	318-319
*	Gateway 2000	Notebooks, PCs, Mail Order, Peripherals	120A-120P
*	Hewlett Packard	Notebooks	221
*	Hewlett Packard	NetServers	225
*	Hewlett Packard	Desktop PCs	227
143	Hitachi PC Corporation	Hitachi V.295	82-83
295	J&R Music World	Systems, Hardware, Peripherals	386-389
*	Leap Frog Lab	PCs	320-321
003	Micro Warehouse	Hardware, Software, Systems	326-327
098	Micron Electronics	Transport Xle, Xpe, Vix	16-17
119	Micron Electronics	Millenia Line-Xru, Mme, Lxe, Transport Vix	209-212
164	Micron Electronics	Micron Family of Products	48A-48J
203	Micron Electronics	Service and Support	5
010	Midwest Computer Works	Reseller, Mail Order, Hardware, PC's	304
156	NEC Technologies	NEC Product Family	201-204
153	NEC Technologies	NEC Direct	214-215
217	NEC Technologies	NEC Product Family	31-34
047	PC Connection	PCs, Peripherals, Software	324-325
068	PC Zone	Mail Order	306-307
287	ProGen Systems	Desktop Computers	130-131
074	Quantex	Quantex Systems	137-139
302	Recompute	Computers/Compatible	383
174	Techmedia	Systems	190
377	Toshiba America	Notebook Computers	174-175
378	Toshiba America	Notebook Computers	176-177
051	USA Flex	Notebooks, Desktops, Peripherals	316
242	UMAX Technology	Computers/Compatible	70-72
055	Unicent	Systems, Mail Order	117-119
*	Unisys Corporation	Unisys Servers	232-233
006	Unisys Corporation	Unisys Servers	244
085	Winbook	XP5 Pro and FX Notebooks	77
DATA BASE MANAGERS			
*	Oracle Corp.	Oracle 8 Universal Server	11
DATA CARTRIDGES & FLOPPY DISKS			
014	Paragon	Infinity	310
DESK TOP PUBLISHING			
*	Micrografix	Flowchart 7	59
DIAGNOSTIC SOFTWARE			
294	Cyber Media	Oil Change	167
DISK BACKUP & TAPE DRIVES			
*	Iomega Corporation	Jaz	194-195
*	Iomega Corporation	Zip	391
855	Micro Solutions Computer Products	Backpack CD-ROM	330
DISPLAY PANELS/PROJECTORS			
390	In Focus Systems	Projector	267
155	NEC Technologies	NEC LCD Monitor Display	122
132	Proxima	Projector	281
251	ViewSonic	PJ800 Portable LCD Projector	253
DISPLAYS/MONITORS			
087	Acer Peripherals America	Monitors	92
*	ELZO NAKAO Technologies Inc.	Monitors	173
167	Hyundai Electronics	Monitors	392
039	Mag InnoVision	MAG InnoVision Monitors	18-19

Reader Service

No.	Company	Product	Page
010	Midwest Computer Works	Monitors	304
157	NEC Technologies	NEC Monitors	C2-C4, p1
118	Optquest	Optquest V95 19" Monitor	153
021	Phillips Business Electronics	Monitors	187
379	Toshiba Japan	Microfilter	96
117	ViewSonic	ViewSonic Monitors	66-67
EDUCATIONAL SOFTWARE			
037	Corel Corporation	Draw 7	189
332	Corel Corporation	WP8, Presentation 8, Corel Central 8	22-23
207	Corel Corporation	Word Perfect 8	376
011	Corel Corporation	Photopaint 7	378
041	Corel Corporation	Gallera	394
ENTERTAINMENT SOFTWARE			
037	Corel Corporation	Draw 7	189
332	Corel Corporation	WP8, Presentation 8, Corel Central 8	22-23
041	Corel Corporation	Gallera	394
FAX SOFTWARE			
134	.01 Communique Laboratory	Communicate!	170
*	Symantec Corporation	SPOHO	364
FAX/MODEM			
208	Brother International Corp.	Multifunction Center	143
FLOWCHARTING SOFTWARE			
*	Micrografix	Flowchart 7	59
*	Visio	Visio	129
GRAPHICS SOFTWARE			
292	Caere Corporation	OmniPage Pro	8
037	Corel Corporation	Draw 7	189
332	Corel Corporation	WP8, Presentation 8, Corel Central 8	22-23
207	Corel Corporation	Word Perfect 8	376
011	Corel Corporation	Photopaint 7	378
041	Corel Corporation	Gallera	394
*	Micrografix	Flowchart 7	59
243	Viagrafix	Design CAD97	284
*	Visio	Visio	129
HAND-HELD PC'S			
*	Hewlett Packard	Palmtops	223
HARD DRIVES			
283	Dirt Cheap Drives	Mass Storage	305
*	Iomega Corporation	Jaz	194-195
*	Iomega Corporation	Zip	391
019	L.A. Trade	Memory, Hard Drives, PCMCIA	322
014	Paragon	Infinity	310
HARDWARE			
235	AMS Tech	AMS Tech TravelPro 2000 Notebooks	41
*	Adaptec	Adaptec NT Desktop	53
*	Adaptec	CD-R	86
081	Altec Lansing	Speakers	368-369
186	BayNetworks Inc.	Instant Internet	180A
208	Brother International Corp.	Multifunction Center	143
*	Compaq Computer Corporation	Sys Systems (Switches)	NE2-NE3
*	Compaq Computer Corporation	Presario	241
*	Compaq Computer Corporation	Compaq Brand	74-75
*	Creative Labs	AWE64 Gold Card	109
*	Creative Labs	AWE64 Gold Card	111
095	Creative Labs	AWE64 Gold Card	113
120	Crucial Technology	Micron Memory Upgrades	65
343	Cyrix Corporation	Cyrix 686MX Processor	38-39
*	Dell Computer Corporation	Dimension	184-185
*	Dell Computer Corporation	Latitude	218-219
*	Dell Computer Corporation	Latitude	234-235
*	Dell Computer Corporation	Latitude	299
283	Dirt Cheap Drives	Mass Storage	305
143	Hitachi PC Corporation	Hitachi VisionBook Pro Notebooks	82-83
*	Imation	LS-120 Storage Device	88
*	Intel Corporation	Networking Products Division	90-91
*	Iomega Corporation	Jaz	194-195
295	Iomega Corporation	Zip	391
106	J&R Music World	Systems, Hardware, Peripherals	386-389
*	Kingston Technology	Memory	262
039	Leap Frog Lab	PCs	320-321
003	Mag InnoVision	MAG InnoVision Monitors	18-19
098	Micro Warehouse	Hardware, Software, Systems	326-327
164	Micron Electronics	Transport Xle, Xpe, Vix	16-17
221	Micron Electronics	Millenia Line-Xru, Mme, Lxe, Transport Vix	209-212
266	Micron Electronics	Micron Family of Products	48A-48J
118	Mita Copystar	Mita Copystar Printers	114
330	Netgear	Ethernet Hub	84
080	Optquest	Optquest V95 19" Monitor	153
068	PC Mail	Hardware	300-301
014	PC Power and Cooling	Power Protection/Cooling Devices	94
884	PC Zone	Mail Order	306-307
074	Paragon	Infinity	310
302	OMS	Network Printers	NE33
178	Quantex	Quantex Systems	137-139
174	Recompute	Computers/Compatible	383
*	Shuttle Computer Group	Spacewalker Motherboards	104
*	Tekmedia	Systems	190
377	Tektronix Inc.	Graphic Printing and Imaging	246
378	Toshiba America	Notebook Computers	174-175
376	Toshiba America	Notebook Computers	176-177
379	Toshiba America	Digital Cameras	198
242	Toshiba Japan	Microfilter	96
006	UMAX Technology	Computers/Compatible	70-72
251	Unisys Corporation	Unisys Servers	232-233
117	Unisys Corporation	Unisys Servers	244
*	ViewSonic	PJ800 Portable LCD Projector	253
*	ViewSonic	ViewSonic Monitors	66-67
HUBS			
215	Dayna Communications	NetCenter	377
266	Intel Corporation	Networking Products Division	90-91
	Netgear	Ethernet Hub	84
IMAGE EDITING SOFTWARE			
018	Data Translation Inc.	Broadway	14
INTERNET			
297	ASP Computer Products	EZ MAIL	160
134	.01 Communique Laboratory	Communicate!	170

Advertisers' Index PRODUCTS

Reader Service

No.	Company	Product	Page
PRINTERS			
208	Brother International Corp.	Multifunction Center	143
004	Epson America	Epson Printer	12-13
*	Hewlett Packard	HP Cash in Trade Up	15
221	Mita Copystar	Mita Copystar Printers	114
884	RMS	Network Printers	NE33
*	Ringdale	Fast Port	NE12
*	Tektronix Inc.	Graphic Printing and Imaging	246
051	USA Flex	Printers	318
REMOTE COMPUTING			
068	Traveling Software	LapLink for all Platforms	266
*	US Robotics Inc.	X2 Networking Technology	145-148
*	US Robotics Inc.	Big Picture	50-51
*	US Robotics Inc.	X2 Technology* Courier I, Modem Pool I modems	NE19-NE29
*	Xircor	Ethernet	25
SECURITY			
070	Trend Micro	NT Suite	NE5
SERVERS			
122	AST Research	Servers	69
092	Acar America	Mobile Client Server	242-243
*	Dell Computer Corporation	Servers	C5-C8
*	Dell Computer Corporation	Dimension	184-185
*	Dell Computer Corporation	Dimension	218-219
*	Dell Computer Corporation	Servers	44
240	ESRI	Mapping Software	256
*	Hewlett Packard	Netservers	225
*	Oracle Corp.	Oracle 8 Universal Server	11
*	Ringdale	Fast Port	NE12
*	Unisys Corporation	Unisys Servers	232-233
006	Unisys Corporation	Unisys Servers	244
*	US Robotics Inc.	X2 Technology* Courier I, Modem Pool I modems	NE19-NE29
SOFTWARE			
134	01 Communique Laboratory	Communicate!	170
297	ASP Computer Corp.	EZ MAIL	160
250	Adobe Systems Inc.	Adobe PageMill 2.0	1800
274	Adobe Systems Inc.	Adobe Illustrator 7.0	259
297	Cables to Go	EZ MAIL	160
294	Cyber Media	Oil Change	167
*	IBM Corporation	VoiceType ViaVoice	20
003	Micro Warehouse	Hardware, Software, Systems	326-327
*	Microsoft	Microsoft Office	2-3
*	Microsoft	Microsoft Exchange	78-79
149	NetObjects	Web Builder	156-157
047	PC Connection	PCs, Peripherals, Software	324-325
330	PC Mail	Software	300-301
*	SPSS Inc.	aICLEAR	317
*	SPSS Inc.	SPSS 7.5 for Windows	323
*	Symantec Corporation	Visual Page	155
*	Symantec Corporation	Visual Cafe	164
*	Symantec Corporation	SPOND	364
088	Traveling Software	LapLink for all Platforms	266
070	Trend Micro	NT Suite	NE5
*	Visio	Visio	129
STATISTICAL SOFTWARE			
*	SPSS Inc.	aICLEAR	317
*	SPSS Inc.	SPSS 7.5 for Windows	323
TRAINING/SEMINARS/CONFERENCES			
*	Softbank Expo	Network & Interop	97
UTILITIES			
294	Cyber Media	Oil Change	167
880	Quarterdeck Office Systems	ProComm Plus	NE15
VIDEO GRAPHICS/BOARDS			
*	Diamond Multimedia Systems	56K Modem	380
VOICE RECOGNITION SOFTWARE			
*	IBM Corporation	VoiceType ViaVoice	20
WIN 95			
064	Advanced Logic Research	Systems	286
*	Avery Dennison	Form Labels, Business Cards, Ready Index	261
177	Cardiff Software	Automated Data Entry	270
102	DataViz	e-attachment opener	277
211	Executive Software	Diskkeeper	268
140	Hitachi	Monitors	250
390	In Focus Systems	Projector	267
280	Mitsubishi Electronic America Inc.	Monitors	273
086	NewSoft Inc.	Presto! PhotoAlbum	265
178	PowerQuest	PartitionMagic	271
132	Proxima	Projector	271
146	Scaptra Technologies	Monitors	280
316	Sys Technology	Systems	274
080	TeleVideo	Monitors	251
066	TigerDirect	Direct	283
WINDOWS SOFTWARE			
211	Executive Software	Diskkeeper	268
*	Micrografix	Flowchart 7	59
*	Microsoft	Internet Explorer	179
*	Microsoft	Microsoft Office	2-3
*	Microsoft	Microsoft Exchange	78-79
125	PowerQuest	DriveCopy	265
*	SPSS Inc.	aICLEAR	317
*	SPSS Inc.	SPSS 7.5 for Windows	323
*	Symantec Corporation	SPOND	364
*	Visio	Visio	129
WORKSTATIONS			
*	Hewlett Packard	Workstation	228-229
*	Leap Frog Lab	PCs	320-321
335	Sun Microsystems	Workstation	193

For Additional Categories see MARKETPLACE PRODUCT INDEX PAGE 331.

Coming Up

What's in the Next Issue of PC Magazine

300-MHz Workstations

Look no further for plenty of power on your desktop. PC Labs rounds up some of the first 300-MHz Pentium II workstations and runs them through its benchmark and applications tests.

Your Next CPU

With Intel's competitors pricing some of their CPUs relatively low, you have some interesting decisions ahead. We assess today's PC processors and compare their technology, performance, and future prospects.

Small-Office Networking

We test small-office networking hardware kits—self-contained packages that include network adapters, hubs, and cabling. Find out how well these packages can get your small office connected.

Uninterruptible Power Supplies

We review ten UPSes that protect server-class systems—most of which now come with management utilities—and help you figure out which size UPS is right for you.



ZIFF-DAVIS INC.

Chairman and CEO Eric Hippeau

Presidents Ronni Sonnenberg (U.S. Publications), Jeffrey Ballowe (Interactive Media and Development Group), J.B. Holston III (International Media Group), Bob Brown (Computer Intelligence/Infocorp), William Rosenthal (Training and Support Publishing Group) **Senior Vice-President** Terri Holbrooke (Marketing) **Vice-Presidents** Timothy O'Brien (Chief Financial Officer), J. Malcolm Morris (General Counsel and Secretary), Rayna Brown (Human Resources), Daryl R. Otte (Planning), Roger Herrmann (Production), Mark Moyer (Controller), Steve Gladyszewski (Information Systems) Herb Stern (Creative Services), Elda Vale (Research) **Treasurer** Thomas L. Wright **Director, Public Relations** Gregory Jarboe

U.S. Publications Group

Presidents Ronni Sonnenberg (U.S. Publications), Claude Sheer (Business Media Group), Lawrence C. Burstein (Consumer Media Group) **Senior Vice-President** Baird Davis (Circulation) **Executive Vice-Presidents, Business Media Group** Don Byrnes, Jack Dolce **Vice-Presidents** Tom McGrade (Business Manager), Jim Manning (Marketing Services), Bob Bader (Central Advertising Sales), Mark Van Name (Product Testing), James F. Ramaley (Circulation Services), Al DiGuido (Group Publisher), Chris Dobbrow, Jim Louderback, Michael J. Miller, Nancy Newman, Paul Somerson, Sam Whitmore **Executive Director, Licensing** Gertrud Borchardt **Director, ZD Labs** Mark Hall **Director, Benchmark Operation** Bill Catchings **Ziff-Davis Media Network: Senior Vice-President** Joe Gillespie **Executive Director** Jeff Bruce **Executive Director, Marketing** Mike Perkowski **Managing Director** Rita Burke **Directors** Ken Beach, Michael Bird, Dan Daly, Melinda Maginn, Scott Murphy **Associate Network Directors** Robin Kofsky, Debbie Moss, Julie Tuttle

Interactive Media and Development Group

President Jeffrey Ballowe **Executive Vice-President** David Shneider **Executive Vice-President** Daniel Rosensweig (President, ZDNet) **Vice-Presidents** Daniel Farber (Editor-in-Chief, ZDNet), James Savage (General Manager, ZDNet), Richard Fisher (ZDTV) **Editorial Director, New Products** Bill Machrone **Group Business Manager** Jocelyn Grayson

PC Magazine, ISSN 0888-8507, is published twice a month except in July and August, at \$49.97 for one year. Ziff-Davis Inc. One Park Ave., New York, NY 10016-5802. Periodicals postage paid at New York, NY 10016-5802 and at additional mailing offices. POSTMASTER: Address changes to PC Magazine, P.O. Box 54093, Boulder, CO 80326-0933. The Canadian GST registration number is 14049 6720 RT. Printed in the U.S.A.

Editorial Product Index

Reader Service No.	Product	Company	Page
953	AccessBuilder 5000	3Com Corp.	NE8
401	Any97, Version 1.03	Anysoft	73
951	Ascend Max 4048	Ascend Communications Inc.	NE6
952	Bay Networks 5000 MSX	Bay Networks	NE8
481	Chat Server 1.59d	Magma Communications Ltd.	182
453	Complete Cleanup	SoftDD	159
454	Cookie Crusher 1.01	The Limit Software	162
455	Cookie Master 2.0	Barefoot Productions Inc.	162
456	Cookie Pal 1.0	Kookaburra Software	166
457	Crumbler 97	Scott McDaniel	166
404	Delphi 3	Borland International	64
450	Desktop Security Suite	McAfee Associates Inc.	152
460	e-Mail 1.0	Frontier Technologies Corp.	172
461	E-Mail Connection 3.1a	ConnectSoft Inc.	172
482	E-Pub Chat 1.01	E-Pub Servcies Ltd.	183
451	eSafe Protect	eSafe Technologies	152
483	eShare Expressions 1.1	eShare Technologies Inc.	186
462	ExpressMail 2.0	OpenSoft Corp.	178
441	Firefly Passport Office	Firefly Network Inc.	135
955	Front Desk	Jetstream Communications Inc.	NE17
406	Fujix DS-300	Fuji Photo Film U.S.A. Inc.	62
442	GroupLens Recommendation Engine	Net Perceptions Inc.	136
402	HP LaserJet 6L	Hewlett-Packard Direct Marketing Organization	68
411	HP 1024	Hewlett-Packard Co.	45
458	IEClean32	NSClean Privacy Software	168
408	i publish	Design Intelligence Inc.	52
407	Kodak DC120	Eastman Kodak Company	62
443	LikeMinds Preference Server	LikeMinds Inc.	141
463	MailSecure 1.0	Baltimore Technologies	178
412	MultiSync LCD400	NEC Technologies Inc.	45
464	Netscape Messenger	Netscape Communications Corp.	180
458	NSClean32	NSClean Privacy Software	168
485	The Palace 1.1	The Palace Inc.	188
410	PanoView 745	CTX Opto Inc.	45
403	Peachtree Complete Accounting Plus Time and Billing 4.0	Peachtree Software Inc.	68
459	PGPCookie.cutter for Windows NT	Pretty Good Privacy Inc.	168
405	Primavera SureTrak Project Manager 2.0	Primavera Systems Inc.	76
956	Replica for Windows NT Single Server Edition	Stac Electronics Inc.	NE18
484	Rooms 3.0	ichat Inc.	191
413	Sceptre FT15	Sceptre Technologies Inc.	45
409	Series 5	Psion Inc.	58
452	SurfinShield Xtra	Finjan Software Ltd.	158
954	Total Control Enterprise Network Hub	3Com Corp.	NE12
486	Virtual Places 2.1	Ubique Ltd.	192
487	VolanoChat 1.1	Volano LLC	195
414	VP140 ViewPanel	ViewSonic Corp.	45
444	WiseWire.com	WiseWire Corp.	142
465	WorldSecure Client	Deming Internet Security	180

NE—Network Edition.

For information about the Network Edition of *PC Magazine*, call Circulation at 800-289-0429.

Abort, Retry, Fail?

No Shelter from Helter-Skelter

This Associated Press dispatch from Corcoran, California, left us just slightly concerned: "A gray-haired Charles Manson was denied parole Thursday for the ninth time after telling prison officials of his activities. 'I'm involved in too many things,' he said. 'I have a Web site I'm working on.'"

Spelling: English [US]

Not in Dictionary:

zzzz

Change To:

sex

Suggestions:

sex

Type "zzzz" into Microsoft Word and you get an interesting suggestion for an alternative to sleep.



The National Bag Co. catalog sells a shrink-wrapper and seems to suggest that you use it to resell your old software. Clever, yes, but not very nice.

Accuracy's in the Eye Of the Beholder

"What makes AutoCAD LT so attractive isn't just the price, it's that it comes with peace of mind built in. Based on the industry standard, AutoCAD, it's the only one of its kind that allows you to share files quickly and accu'y"

—AUTODESK AD

If your entry is used, we'll send you \$50 and a *PC Magazine* T-shirt. Send your entries to Abort, Retry, Fail?, *PC Magazine*, One Park Ave., New York, NY 10016-5802 or via e-mail (text items only) to don_willmott@zd.com. Winners this issue: Whitney McNulty, Dan Vogen, and Max Wolf.

WEB SITE STORY CAFE
at EWA HOTEL WAIKIKI

Looking for a

INTERNET SPECIALIST/BARTENDER
MANAGER

Japanese/English Speaking required

We've found the perfect high-tech job. (*The Honolulu Advertiser*.)

Overheard

In a recent meeting with *PC Magazine* editors, Symantec vice president Christopher Calisi coined not one but two new buzzwords:

Day Extender: *n.* A person who comes home from the office only to log back on to the network to get more work done.

Sunset: *v.* To discontinue a product.

Example: "Many pessimistic analysts think that IBM should sunset OS/2."



"...and here's me with Cindy Crawford. And this is me with Madonna and Celine Dion..."

QUENCH YOUR THIRST FOR POWER WITHOUT DRAINING YOUR WALLET.

DELL® LATITUDE® LM M166ST 166MHz PENTIUM® PROCESSOR WITH MMX™ TECHNOLOGY

- ★ 12.1" SVGA Active Matrix Display
- ★ 16MB RAM (72MB Max)
- ★ 256KB L2 Pipeline Burst Cache
- ★ NEW 1.6GB Hard Drive
- Options Bay accepts 12X Max* Variable CD-ROM, 3.5" Floppy Drive (both included) or Optional 2nd Lithium Ion Battery
- ★ PCI Bus with 128-bit Graphics Accelerator with 64K Colors
- Integrated 16-bit Stereo Sound
- Smart Lithium Ion Battery
- ★ Microsoft® Office 97 Small Business Edition
- Microsoft® Windows® 95
- IrDA 1.0 Standard Compliant
- Touchpad/Under 7 Pounds*
- Extendable 1 Year Warranty†
- ★ Upgrade to 40MB RAM, add \$299.
- ★ Upgrade to a 2.1GB Hard Drive, add \$149.
- ★ 2nd Lithium Ion Battery, add \$199.
- ★ Motorola 33.6 Fax Modem, add \$149.

\$2999

Business Lease*: \$108/Mo.
Order Code #680140

DELL®

TO ORDER TOLL-FREE

800-424-1365

TO ORDER ONLINE

www.dell.com/buydell

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT
Sun 12pm-5pm CT In Canada, call 800-233-0702
GSA Contract #GS-35F-4076D

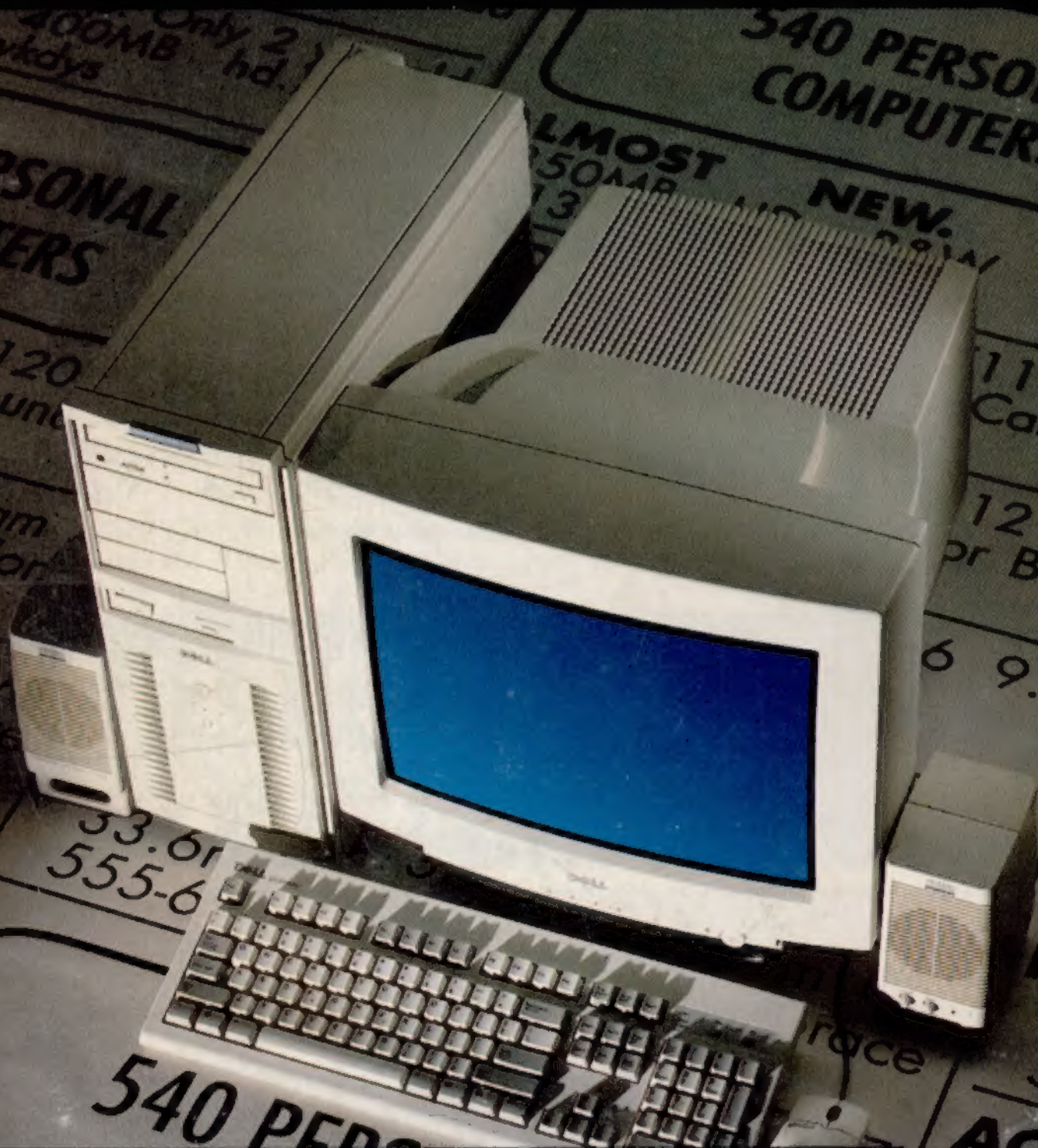
Keycode #04518

NOW GET THE AWARD-WINNING DELL LATITUDE LM M166ST NOTEBOOK FOR ONLY \$2999!

Sure. Power comes at a price. Fortunately, it's one you can afford. Because we've lowered the price on our award-winning, powerhouse notebook, the Latitude LM M166ST. You see, we started out with the fastest Mobile Pentium® processor available, the 166MHz Intel® Pentium processor with MMX™ technology with a 32KB internal cache. Then we added an improved 128-bit graphic accelerator for blazing fast video, 64K color depth and true multimedia functionality. The result? Well, *Windows Magazine* tested an LM M166ST configuration† and puts it subtly in their June '97 issue: "The fastest notebook we've ever tested with every option you could ever want." Not bad for a notebook line starting at under \$3000. And you get all this from the only notebook manufacturer to receive an "A" grade based on *PC Magazine's* July '97 Service and Reliability Readers' Survey results. So go ahead and give us a call. Because while the performance puts the LM M166ST over the top, the price brings it well within reach.



HOW MANY COMPANIES WILL LET YOU RETURN YOUR COMPUTER WHEN IT BECOMES OBSOLETE?



DELL DIMENSION® XPS H266

266MHz PENTIUM® II PROCESSOR
FEATURING MMX™ TECHNOLOGY

- Mini Tower Model
- 32MB EDO Memory
- 512KB Integrated L2 Cache
- 4.3GB Hard Drive [10ms]
- 1000LS Monitor (15.9" v.i.s.)
- NEW 4MB EDO VIRGE 3D Video Card
- NEW 24X Max⁵ Variable CD-ROM Drive
- Integrated Yamaha 16-Bit Sound
- Altec Lansing ACS-290 Speakers with Subwoofer
- NEW 56K Capable** U.S. Robotics x2 Modem
- Microsoft® Office 97 Small Business Edition plus Encarta 97
- Microsoft Windows® 95
- Microsoft IntelliMouse
- 3 Year Limited Warranty† with 1 Year On-site^A Service

Personal Lease

\$119/Mo.

or buy today for \$2679

Order Code #500811

**INTRODUCING DELL'S PERSONAL LEASE WHICH PROTECTS YOU
AGAINST OBSOLESCENCE. CALL NOW FOR MORE DETAILS.**

A little overwhelmed by the rate of technology change? Suffering from the "fear of computer commitment?" Well, you can breathe easy now. Because in addition to our business lease program, Dell is now offering computer leasing directly to consumers on all our Dell Dimension and Latitude LM systems. With an over-the-phone approval process that takes less than a minute and low monthly payments, you can get the latest technology on your desk in a snap.

But here's the real advantage: at the end of the 24-month lease period, you can trade your system in for a new one!† This practically guarantees you'll never be stuck with obsolete technology again. And in the unlikely event you need service, your system is covered by our service program for the entire lease term. Plus, as added flexibility, you have the option to buy your leased system outright at the end of the lease term, or even extend the plan for six months.† So call us now for more details.



⁵Monthly lease payment, based on 24-month lease arranged by Dell Financial Services L.P. Due prior to delivery: \$238. No security deposit required. Subject to credit approval and availability. Lease terms subject to change. †Some conditions apply.

DELL®

TO ORDER TOLL-FREE

800-627-0660

TO ORDER ONLINE

www.dell.com/buydell

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT
Sun 12pm-5pm CT In Canada, call 800-233-0702
GSA Contract #GS-35F-4076D

Keycode #04517